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ABSTRACT

The purpose of the seminar reported on in this document was to examine educational problems in the light of socioeconomic development prospects for the year 2000 and in particular to ponder the implications of socioeconomic development for educational planning. As an international inquiry into observed and foreseeable educational trends, the seminar was also meant to compare the views of a variety of schools of thought and branches of learning. Part 1 of the report comprises a lengthy summary of the seminar's discussions on three topics: the place of education in development projections to the year 2000; world trends in school enrollment and the long-term prospects for educational development; and trends in the relationship between education and employment. Parts 2-4 present 19 of the 37 background papers prepared for the seminar. In Part 2, seven papers discuss the nature of education in the future. Seven papers in Part 3 analyze models of long-term educational and economic development. The remaining five papers in Part 4 examine economic and social consequences of educational development. Four appendices provide the seminar program and lists of seminar participants and of the 37 papers prepared for the seminar. (Author/RW)

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The future of education and the education of the future

Final report and documents
of an IIEP Seminar,
Paris, 23-26 October 1978

Edited by R. M. Avakov

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INTRODUCTION

Questions about the future

In the last few years numerous national and international debates have revolved around the long-term prospects for socio-economic development. There is the alarmist view represented by those who ask: "Is there any chance of survival for mankind?" Others very optimistically paint an unreal picture of the future, proposing, as Colin Clark did, palaces floating on the high sea. And there are others still who call for immediate action, for "tomorrow will be too late". They are all unanimous in stressing that it would be irresponsible to shut one's eyes to the challenges of the development process in the world today, a unique, unprecedented process since the conditions prevailing today are unique, and are fraught with agonizing socio-political, economic and cultural contradictions.

The importance of these questions is underscored all the more by the fact that there is a marked trend for an increasing number of human problems to become world-wide issues. This calls for a new approach to the problems facing mankind today, a global approach which requires us to show them in all their interrelated aspects and not as being isolated from one another. As a result of these discussions, global models have been devised, all of which are based on the idea, indeed on the fundamental conception that many of the problems of crucial importance for the future of mankind are overall problems and that only this approach to all the issues involved in development can provide a sound basis for decision-making.

Man's desire to see into the future, to imagine what lies ahead, is nothing new. It is an idea he has cherished for millenia, ever since his emergence as a social being. And even way back in times past, the dream was not prompted simply by curiosity to penetrate the secrets of the future and try to conjure up a mind picture of what society might be like one day. It also (and perhaps above all) sprang from the hope that practical conclusions might be drawn from it so that man might be able to fulfill his ambition of being master of his destiny. "To govern is to see ahead" is no recent maxim and though not put in so many words, was known to men in ages past, who fully realized what priviledges, potential and strength the weapon of foresight could give them.

How the field of inquiry has broadened

Questions as to the future of the world which were initially concerned mainly with the limits to the physical environment, soon went beyond this particular issue to include other important factors of development, especially education. A number of works have already been published on the future of education and other forward-looking studies are currently in hand in international organizations and in several countries. To take but two of the projects: one has been launched by Unesco which proposes, as part of its programme for 1979-1980, to carry out a study on future trends in the development of education in the next two decades; and the other has been undertaken on the initiative of the Club of Rome and concerns the problems of human learning.

The factors underlying the debates on the future of education are quite clear :

- Education, by its very nature, looks to the future and prepares for it; in other words, its rôle is to contribute to the efforts of man and society as they move towards that future. What society does man aspire to build? And what kind of man for that society? These questions are central to any inquiry into the future of education and into the education of the future.

- Education is of universal interest and concerns everybody: the individual, the community, mankind as a whole. Regardless of age and sex, it is for all man and for all men. Education is universal also because it concerns everything : professional and social activities, leisure time, every aspect of life and all through life. Nobody - either society or the social classes of which it is composed - can adopt a neutral attitude to education.

- Education is not only a fundamental aim but also a means of fostering relations of a new kind in the international community. It should be regarded as an integral part of the New International Economic Order (NIEO) and as a factor in promoting it. Any reflection on the future of education should therefore be seen in the context of the establishment of the NIEO.

Overall context for reflection on the future of education

Questions on the future are often placed in an overall context. A discussion on the future of education must therefore necessarily proceed from an examination of the present-day educational situation, seen in a world-wide context. The interdependence between the present and the future is undeniable in many fields, for example, with regard to limited resources or pollution. One of the foremost tasks is to define the national as well as the international dimensions. In other words, any analysis of education and its future should reckon with two central factors, namely differences and similarities regarding not only education in its narrowest sense but also the economic development and socio-political level of the countries.

It is important to be able to make the distinction between objective overall conditions and those which are peculiar to each country if the aim is to be to find real alternatives for the future.

The question arises, however, whether and to what extent education is an overall problem, and furthermore how education in the overall sense and national education can be interrelated.

A global approach would entail associating educational development with socio-economic development. Development means change, and any move to bring about change involves automatically a conception of man and society.

Of what, then, might a global model for the development of education consist - a combination of several optima within one and the same model, or the predominance of a single economic optimum?

The fact that education, its various functions and its alleged or real failures are being reconsidered should not stand in the way of reflection and the search for alternative forms of future action. A thorough assessment is necessary to be able to analyse the situation more deeply, as a first step, and then to find fresh solutions and carry further what at present is no more than a series of tentative experiments.

The future is that onward extension of the present and past that makes it possible to work out alternatives for the years ahead by means of a qualitative and quantitative accumulation of data.

It is our priviledge today to be able, deliberately and rationally, to influence the future. But it could also be dangerous, if that influence was concentrated on a conception of science and technology as autonomous phenomena without taking into account either the human factor or power relations.

IIEP Seminar

The International Institute for Educational Planning (IIEP), appreciating the importance of the discussion on the future of education and acting in accordance with its official policy, took the initiative of organizing a seminar on "Long-term prospects for the development of education", which was held in Paris from 23 to 26 October 1978. The seminar came under the above mentioned Unesco project. Its purpose was to examine the problems of education in the context of socio-economic development prospects for the year 2000, and in particular their implications for educational planning, by comparing the views of those representing the various schools of thought and branches of learning. It was not an academic exercise or just a venture into futurology, but was an inquiry into the observed and foreseeable trends in education, as a contribution to the work already or as yet to be done on understanding and solving the problems of its future development.

Three topics were selected for the programme of the seminar (see Appendix I, programme of the seminar) :

(a) The place of education in development projections up to horizon year 2000.

(b) World trends in school enrolment and long-term prospects for educational development.

(c) Trends in the relations between education and employment.

Research workers and specialists from some 30 countries took part in the seminar (see Appendix II, list of participants). Thirty-seven background papers had been prepared by the participants and by IIEP (see Appendix III, list of documents) and they provided a wealth of source material for discussions both at the plenary sessions and in the three working groups (see Appendix IV, composition of working groups). Nineteen of these papers are contained in this publication, others constituting a separate volume produced by and obtainable from IIEP.[1]

A synthesis report can of course only give a broad idea of what went on during four days of spirited discussions in which a number of distinguished specialists took part. This document gives only a tentative summary of the main topics discussed by the participants, and the debates were in fact far fuller and more searching, and reflected many more shades of opinion.

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[1] Long-term prospects for the development of education. Documents presented at an IIEP seminar. Paris, IIEP, 1980.

IIEP based this report to a large extent on the discussions, especially the oral reports submitted by Mrs. N. Sudarkasa, Mr. J. P. Naik and Mr. A. E. Solari to the plenary session, and on the summary records of debates in the working groups prepared by Mrs. P. Zagefka and Mr. T. G. Whiston. We should like to take this opportunity to express our deep gratitude to them for their special contribution. Our thanks also go to Mr. M. S. Adiseshiah again, for he as Chairman was largely responsible for the success of the Seminar, and also to the Chairman of the working groups, Mrs. G. L. de Romero Brest, Mr. B. Suchodolski and Mr. P. H. Coombs.

PART ONE

SYNTHESIS REPORT

PART I
THE PLACE OF EDUCATION IN DEVELOPMENT PROJECTIONS UP TO HORIZON YEAR 2000

CHAPTER I
STATEMENT OF THE PROBLEM

Any inquiry into the future of education, into expected changes or any which might come about in the next two or three decades must be carried out in a broader context than the education system alone, for education does not develop as an absolute phenomenon and cannot be divorced from prevailing socio-economic, political and cultural circumstances. Its development is also affected by the international context. What type of change? With what end in view? And how would it come about? These questions and so many others on the future of education are contingent upon its relationship with its twin national and international environment.

A. THE NATIONAL CONTEXT

With regard to the national context of educational development, three aspects of the problem were referred to in the course of the discussions :

- choice of society;
- that society's relationship with education;
- type of education for the society of tomorrow.

To state the obvious, it may be said that there are all kinds of inequality between countries and within any one country. Over the past thirty years, there has been an upswing in those inequalities in several countries rather than the reverse, especially in the field of education. This marked tendency should not be allowed to persist. Clearing the way towards the society one wants to build for the future therefore necessarily entails reducing inequalities as soon as possible. And this calls for an in-depth study of the real causes.

The least one can do by the year 2000 is to satisfy the basic needs of the vast majority of the world's population whose living conditions are inhuman. In the endeavour to reduce inequalities, cultural diversity must be preserved and advantage must be taken of this valuable asset which man has at his command. Attempts to impose a cultural pattern on a people are incompatible with its right to choose a life-style and education system of its own free will. But in refusing domination, the danger of cultural isolationism must also be avoided.

Relationship between society and education

In order to investigate the future of education, a better grasp of the inherent nature and true dimensions of its relationship to society is needed. According to one radical view, education, being a subsystem of society, is wholly conditioned by social, economic and political practice and only has a subordinate rôle to play in the development process. Another view overestimates the rôle and potential of education and strongly emphasizes its unique power in shaping society.

Neither of these concepts provides a sound basis for an examination of the relationship between society and education. It is not a one-sided or uni-dimensional but in fact dialectic relationship. Society does of course determine its education system and this fact should not be overlooked. The importance of the social factor for education is self-evident and cannot be denied. From this point of view, the criticism of and dissatisfaction with education, though arising from the present effects of the educational situation, are often unjust, for criticism should in fact be levelled at the present state of society.

The second point to make is that since education is adapted to the society which determines it, it can help to carry out major changes, and can prepare the ground for the introduction of these important changes. However, education alone cannot bring about this global transformation of society. It should be added that it may be not only the agent of change but also a means to preserve the social status quo and a hindrance to any alternative solution for the future. In other words, education could be a balancing force but also a disrupting force in society. But it can never remain a silent, indifferent spectator of the social, political and economic development process that is taking place.

The fact that society is the determining factor in education does not mean that the latter should be dispensed from all responsibility in its development by attributing all the prevalent evils and shortcomings to society. In fact education has often suffered from misconceptions the harm of which has only become apparent later. Some went even further and claimed that it was, in a sense, a 'failure story'. It would, however, be fairer to say that it is the impact of the social background which is predominant in education.

The type of education for the society of the future

A critical analysis of the present state of education was taken as a starting-point for discussion of this fundamental issue and as a basis for both the development and a thorough appraisal of the positive results achieved and an appreciation, but not an overestimation, of past and present shortcomings, the purpose being to provide a better education for the future -better for the individual, for society and for human needs as a whole. This appeared to be the general trend of the debate.

Education may be a 'reflection' of the economic, political or other situation, but school is a singular institution in that it may be said to be truly an investment for the future. The question of the content of education is therefore extremely important and it came up several times in the course of the debate. Determining the content of education such that it will be practicable in the future means that States must plan their future needs. The importance of foreseeing the skills and know-how of the future was repeatedly stressed.

Educational goals must be redefined in terms of future needs, but also in terms of all the political and economic factors of society. This also implies intensifying educational processes and constantly improving upon methods, for the latter have an important rôle in the transmission of knowledge.

It is, however, important to bear in mind that education should contribute to the harmonious development of the individual and this all-important goal should not be neglected in bringing about changes in structures, subject matter, and so forth, in education.

Education should help to develop human inventiveness and creativeness; it is their source of inspiration and as such constitutes a lasting sum of knowledge as opposed to the fleeting knowledge acquired in learning a particular technique, or in training which could also be a form of manipulation.

The significance of social, political and economic factors cannot be overlooked in a discussion on the education of the future. The international organizations should, at least, be able to bring the political problems to the fore by fostering a broad-based debate in a spirit of mutual understanding and co-operation.

B. THE INTERNATIONAL CONTEXT

The seminar could not remain aloof from the major debate which is at present taking place on the New International Economic Order (NIEO). What is the educational dimension of the NIEO? was how the question was formulated. Two aspects of the question were considered: (i) education as an integral part of the NIEO; (ii) education as a factor in promoting the NIEO.

Education - an integral part of the NIEO

The idea of the NIEO is a reaction against the glaring inequalities between countries, affecting in particular the newly-independent former colonies, and a manifestationof the need to alter this state of affairs. This conception, which initially drew attention more particularly to the economic and commercial aspects of inequality, was subsequently deepened and broadened so that the NIEO has now come to be looked upon as a real change (or an agent of change) in every sphere. In other words, the aim of the NIEO is far more than a redistribution of trade among States. The object is to bring about reforms which would help to reduce existing inequalities and the dependence of the developing countries, thereby delivering these countries from poverty, hunger and illiteracy.

Since education is a sphere in which there are blatant inequalities between nations, it should be included in the broader concept of the NIEO. The fact is that the NIEO also implies a redistribution of labour and therefore of income and education as well, so that one may legitimately place emphasis on a new international educational order.

One point should be made here. The object is not to unify all the national systems of education. A new international educational order implies the diversity of education systems developing on an equal footing, in conditions allowing for a free interchange of national experience. The NIEO could thus provide the framework for profitable research and implementation of national education policies capable of dealing with inegalitarian tendencies at both the national and the international level.

Education - a factor in promoting the NIEO

Education can and should play a positive rôle in efforts to establish the NIEO. Education systems are in a position to provoke a nation-wide and indeed world-wide debate on the NIEO, on the origins and root causes of the present inegalitarian order, and the possible ways, including the type of action and machinery required, of altering it. Education, and teachers in particular, could help to promote research providing deeper insights into the very concept of the NIEO.

Students, as well, should be involved in the debate and in efforts to establish the new order, for after all the future of education and the NIEO is also the future of those who are fortunate enough to pursue higher studies. Students cannot be indifferent to what the world of tomorrow will be like and to how, by what means, we can create it.

Another possible contribution of education is the enlistment of public support for the NIEO since the success of the promotion movement depends both on the concrete decisions to be taken at the international and national level and on a favourable response by broad sectors of the population, which is where education systems have a big part to play.

Another way in which education systems could contribute effectively to the reduction of inequalities between nations would lie in positive steps to reduce inequalities within the specific field of education. They should promote egalitarian tendencies such as the move towards universal primary education, and combat reverse tendencies such as the dissociation of brain from manual work or the gulf between formal education and working life.

CHAPTER II
EDUCATION : A GLOBAL AND NATIONAL ISSUE

Education both as a global phenomenon and as a system specifically related to a given set of cultural, political and economic factors nevertheless needs to be analysed in depth, with the focus on certain aspects. A systematic study shows clearly that there is overall agreement on these aspects.

Is education a global or a strictly national issue? And to what extent can one define (and hence 'perceive') its global and/or specific nature? And again, is that specificity, advanced by those who advocate the theory of a national education, ultimately hinged to purely political considerations, in which case what might its implications be in terms of both theory and concrete educational policy?

A. LIMITS TO A GLOBAL APPROACH

Concept of education as a global issue

In the first analysis it is agreed - and accepted - that beneath the apparent similarities between the names given to (institutional) educational structures, the underlying reality is very different and can only be accounted for by a series of national historical, political and cultural factors - at least in regard to formal education. In other words, on the whole education is basically a national issue and the attainment of its goals is primarily a national task, in the light of the historical experience of the nation.

Despite this, one finds, however, that the differences between national formal education structures are not so very great - although the names given them may vary - in that there is an often remarkable similarity of aim, and that ultimately their objectives, if not expressed in the same terms, are to a great extent comparable. In other words - and this was recognized by participants - there are certain common features which lead one to believe that education might be regarded as a global issue. It is a very important point to stress in its bearing upon international and regional co-operation, exchanges of national experience and the dialogue between different cultures.

However, when it comes to comprehension and analysis, the only course - and this is all-important - is to circumscribe common factors and problems, as well as national realities and problems, which should be stated clearly without any refuge in the assertion that "they are specifically national issues". In other words, the specific features constituting the diversity of different types of society and cultures should not obstruct a thorough going analysis upon which international and regional co-operation might be based.

Before actually going into the question of whether education was a global or national issue, or both, it was thought necessary to specify what the term 'global' implied. Although it is becoming increasingly clear that certain educational problems such as selection and promotion, and education as a preparation for certain types of employment, are broadly applicable, both the form and the content of such problems falling into the global category remain to be defined for each individual country, within the broader concept.

The question is, then, whether in education there is a single global issue or several. Strong emphasis was placed on this throughout the seminar.

Dialogue and co-operation

Although there is undoubtedly a trend towards unification as regards science and technology, and this trend could be taken up and adequately developed for the purposes of the NIEO, this does not seem to be the case with regard to specific national and regional features, for which co-operation would be the only course.

Such inter-state and inter-regional co-operation could only be set up if there were some previous form of reciprocity planned and organized by the States. Arranging for such mutual contact between States and regions, scientists, educators, administrators and the like, by no means implies unification, still less the establishment of power relations compelling some nations to copy blindly from others and/or involving the domination of certain educational models.

Only a just dialogue could safeguard against a misguided conception of the global approach as has prevailed in several developing countries up until now.

The need to take into account each country's specific cultural potential - and not just its technological and scientific machinery which is indeed of considerable importance but should not overshadow the significance of national cultural characteristics - cannot be emphasized enough.

Assessing the past and present situation, we are compelled to recognize that one of the factors adversely affecting the educational situation throughout the world is a uniform, one-sided view of development and a single conception of knowledge as a neutral, universal and scientific phenomenon. In fact, science and technology is very often taken to mean the science and technology evolved in the West, while important technological and scientific achievements in several fields by other civilizations, such as those of India or China, are overlooked.

Diversifying education, challenging the concept of a single, unilateral form of knowledge and thereby accepting the potential plurality of forms and courses of development should provide the basis for the framing of a course of action for the NIEO.

For those who condemn cultural dependence, a dialogue between different civilizations is the only possible and viable alternative, for they fear that any attempt to universalize and globalize education will have the effect of accentuating dependence structures. Education, they maintain, is not only for personal, national and cultural independence, but should endeavour to preserve certain values which are different from those prevailing in the industrial West.

Starting from an analysis of the present situation

Although generally speaking the discussion focused on the future, especially on the future of education, the participants felt it was only natural, in order to explore the future, that they should examine the present educational situation, and the problems and difficulties facing the developing countries today. This review of the present (and past) situation is necessary because :

- There can be no reflection on the future without considering the present, the limits set by the extent of a society's potential and resources, and socio-political and economic systems.

- The present educational situation, its constraints and the factors affecting its development are not always properly grasped and as a result there is some controversy and confusion over these issues which need to be cleared up.

- Criticism of education and its results is not always based on sound criteria, being apt to regard negative experiences as the general rule, while under estimating and sometimes overlooking significant achievements. A scientifically well-founded assessment is thus called for, a critical appraisal of the arguments advanced, so as to present a realistic picture of the present state of educational development in the world without disregarding the many positive factors or exaggerating some of the failures.

Such an analysis would then make it possible to raise the question whether the future is simply a continuation of the present or offers an entirely different alternative. And how could the scope of that alternative be defined?

Some of the participants stressed that total change was possible, placing emphasis on a Utopian conception of education as against one opting for conformism and continuity. They felt one should not think solely in terms of education for the future, but education for Utopia in the sense of a complete change.

Others placed greater emphasis on the relatively widening gap between the present, the current educational situation, and the future we want to create, in other words the conception of education as a liberating force countering competitive learning aimed solely at individual selection and promotion.

The cause of this ever-widening gap between the present and the future seems to lie chiefly in parents' and educators' "way of thinking" and ideologies, which are the main obstacle to educational change of any kind, even when the change has been satisfactorily planned and put abroad by the political authorities. Even the very best educational policy will not be able to elicit a positive public response to innovation on its own. A flagrant example is that complete ignorance prevails regarding preparation for citizenship and working life as a form of education. Instead, the overriding view at present is that education is only a form of training for certain jobs and hence a certain level of income. Parents and educators are principally responsible for advocating and strengthening this view.

There should not be any confusion between the need for complete change and the realistic prospects for such change. The general feeling among the participants was that there would be no radical changes over the next two or three decades, and that the pattern of change in the future would be much the same as in the past. Unless there were unforeseen developments, no radical upheaval was to be expected leading to the establishment of entirely different education systems from those operating at present.

B. EDUCATIONAL ASPECTS OF GLOBAL DEVELOPMENT MODELS

A large number of global models have been drawn up by international and national institutions over the past ten years or so. The methods of analysis and the area of study vary from one model to another. What they all have in common is that they seek to investigate the future of the world and all hinge on a central idea, namely that many of the problems confronting us throughout the world are overall problems. This leads to the basic conclusion, or indeed conception, that an understanding of the global character of the issues involved in development is the only sound basis for decision-making.

In all of these models, with the exception of the Bariloche Foundation's Latin American model, "A world for all", there is an all-important conceptual weakness: they focus their analysis on the technico-economico-mathematical aspects of the question, on the idea of the limits imposed by the physical environment, without taking into account either the socio-political aspects or any changes that might come about in the future. It may also be noted that that only in the Latin American model is education included as an integral part of the investigation of the future. None of the other models refer to education except as a residual factor.

Why this neglect of education? Education may well be a national issue, but would it be paradoxical to examine it as part of a global model? An analysis of these models does, however, appear to be necessary for a comparison of different approaches as regards changes which are to come about in education in the near or distant future on the basis of global predictions.

The analysis : its limitations

Because of the need to foresee the real possibility of change and determine the possible course such change might take, existing models have been analysed from the standpoint of the relevance of their findings with a view to educational planning.

An analysis was also made of the theories representing the view that education is a dependent variable, bearing in mind the effects of these theories on the structure of educational provision itself; other theoretical bases might have different consequences for education.

The importance of history was recognized as being closely linked to anticipating future trends; it was thought that historical interpretations provide an indispensable basis for a prediction of large-scale social changes.

It was pointed out that forecasting had its limitations in that it led perforce to positions and interpretations that were necessarily a standardization regarding both the present situation and future trends.

Although there has been an attempt in the mathematical models of systems to go beyond these problems of interpreting the present and the future, they have not been entirely successful. They are interpreted in a wide variety of often contradictory ways.

As a result, all the models are a standardization and are deterministic in so far as they depend largely on their authors' attitude and view of the world. The projections are of course not limitative and cannot supply information on all the factors involved.

The most important alternative to models is the construction of scenarios, which involves identification of the most significant trends and their extrapolation in the future. According to a more explicit definition of scenarios, they may not only be a set of macro-economic variables - as they are commonly held to be by economists - but also include a description of social, political and cultural variables.

An exception was made, however, for quantitative models. It would be naïve at this stage to think we could do without them. Their importance is established beyond doubt, on condition that they adopt a multidimensional approach. Another point to make is that they alone are not sufficient, for they could never replace a qualitative analysis.

Moreover, mathematics do not give us the optimum. No quantitative analysis, no model, can overcome the problem of defining and deciding upon the optimum, which will remain a political question.

Determining the optimum, whether it be economic or educational, implies a series of decisions which can only be taken by the political authorities. The drawback of extrapolating past trends is precisely that it fails to consider the possibility of political change. As was pointed out during the debate on global models, most of these models are no more than the replica of the old free market scenario. The NIEO formulated by the Group of 77 is in line with this trend. The other proposed formulation of a global model is Samir Amin's and the Bariloche Plan's "collective self-directed development".

There are - and this is the most interesting point - very marked differences between the various models as regards both their findings and their respective projections. The implications for education consequently vary a great deal.

Three trends

The purpose of the effective analysis was to determine the rôle of education in the global models or, more broadly, in global projections for the future, and to discern the implications of these models for education. The fact is that although as a rule education was not included in the principal models drawn up, the implication was nevertheless that education would play a considerable part in attaining their proposed goals, and that there was a need to reform education in the light of new development strategies.

Three trends were considered : firstly, economic trends as reflected in the models and what the effect would be regarding public spending on education in relation to economic growth or non-growth; secondly, population trends, especially the problem of changing demographic patterns, with special consideration being given to how the demand for education could be met; and thirdly the trends with regard to various skills, the future demand for skills and hence the effects of these trends on education and, indeed, on training.

(a) Economic trends as they appear in the models - which are highly comparable - are grouped around one main variable, namely per capita income. Despite significant discrepancies between estimations of future growth and/or stagnation of per capita income in the various regions of the world, it emerges clearly from the above analysis that the economic reasoning behind these models is based on a relatively small number of assertions. Although the basic premises in these models seem to be very detailed, the general assumption is that of an accumulation of capital in which the GNP growth rate is geared to investment returns and improved productivity.

Considerable emphasis is placed on levels of investment and technological change. The direction technological change will take is a central issue as regards employment figures and the various types and levels of skills required (and consequently types and levels of education).

With regard to education as compared with other consumer goods, most of the models maintain that it will increase in proportion to the increase in per capita income. In Europe, for instance, public spending on education in relation to total income will move nearer to that of the United States and expenditure in the developing countries will approach that of the developed countries.

(b) The differences between the various models as regards anticipated demographic trends are even greater and are difficult to compare. Although world population growth is an extremely important variable to be considered when calculating the demand for various consumer goods, it is subject to a whole series of factors which vary from one model to another. From the point of view of educational policy, the differences between anticipated population figures are all the more significant when one considers that the various figures proposed are based on different assumptions for the birth rate, and as a result they mainly concern school-age children. The uncertainty about demographic trends is serious since it is directly linked to the school-age population.

Despite these uncertainties there does not seem to be any radical change ahead in the demographic situation of the developing countries; it is their present situation which is dramatic.

In some developed countries, it would appear that demographic stagnation may result in a corresponding stagnation in school enrolment rates, but this is not explicit in the forecasting models.

(c) The trends as regards changing skill patterns as an indication of the demand for certain levels of education are even more difficult to deduce from the models, since they circumvent the issue by ignoring it. This is particularly serious since the notion of skill needs to be reconsidered and ultimately redefined.

In all the models, manpower requirements - which are not differentiated - are calculated in direct relationship to capital or in terms of a Cobb-Douglas production function with limited capital-labour substitution.

Other determining factors in future labour requirements are the technological or institutional data which may have a negative or positive effect on a certain pattern of markets, materials, technological know-how and capital. Technological change is one of the most important factors in determining future manpower requirements both as regards the skills required and in establishing the proportion of capital to labour, if the definition of technology is taken to include the organization of labour.

Predicting such factors clearly provides the basis for a prospective view of education, even if seeing education in terms of employment may appear to be a highly restrictive approach.

The important thing would therefore be to make an in-depth study not only of the correlation between the quantified macro-economic variables and demographic variables set forth in the various models, but also of the implications of the non-quantitative assertions they make for different types of development and education.

Three questions

This approach, which unfortunately was not as widely discussed as it deserved to be, was the only one in which there was an attempt to compare the various existing models on equal terms and the only serious attempt to draw from them the conclusions and implications with regard to education. In other words, the question that was asked was what type of education would there be if each of these models were applied and put into effect.

The analysis was of special interest for another reason, namely that it raised three other questions to which the answers might be sought in the models:

(i) The question of poverty: although all the models recognized how acute the problem of poverty was in the world, none of them - except, again, the Bariloche plan - considered the question of equality, even in its most classic form, namely income distribution.

(ii) The question of transition : at what stage of social transition should the aims of each model be carried out, and, in line with this, what is the policy to be adopted during this transition stage?

(iii) The third question concerns the appropriation of knowledge as a means of acceding to power.

Access not to knowledge but to information was also referred to, information being considered here as the power of tomorrow. But the definition of information given in this last approach was far more confined to expertise in handling computers, whereas the appropriation of knowledge makes it possible, for one thing, to give a broader definition and, for another, brings in the question of power relations and even structural interrelationships, and therefore that of mediation and the access to all kinds of knowledge. At the same time, it induces the problem of equal (and unequal) opportunity highlighted by education.

A final comment

As was stressed, a type of education is needed that will teach young people that the society we live in is not the best or the final stage. Education is not a sector of development but is interrelated with all forms of development. At present there is no such thing as a conception of 'global' development, which raises a number of specific problems for education, especially in regard to the contradiction between social demand and social needs.

What is required, then, is to reconsider the notion of skills and its real implications, as well as education/training as a whole, especially its two main functions which are social control and reproduction of the workforce.

One of the participants' suggestions reflecting the view that present models and methods of explanation and analysis should be re-examined stressed the need for efforts to collect data on both formal and non-formal education and its achievements. The data we have is confined to certain subjects such as costs or teachers, for example, and do not reflect the true situation; in fact the approach to data collection is an academic one and is therefore of limited relevance.

CHAPTER III
INNOVATIONS AND ESSENTIAL THRUST OF REFORMS

A. CONCEPTUAL ASPECTS

Tradition and innovation

The introduction of new teaching methods and, if need be, new contents, was unanimously recognized as being an all-important goal for the future. There are, however, many different aspects to the problems dealt with as central issues at times of educational change. To begin with, there is the problem of tradition versus innovation in the education system. A number of participants warned against the dangers of over-anxiety to introduce innovation and change. Before dissemination, any innovation or change must be monitored and justified by an in-depth analysis of the real needs of society and the foreseeable results.

Tradition plays an extremely important part. A striking example is religious instruction. It is more often than not steeped in retrograde conservatism and can become a foothold for cultural and political protest. For the traditionalists, modernization can never be brought about outside the framework of traditional values, but should aim at real integration bearing in mind the desires, values and experience of the people as a whole.

Another cautionary standpoint warning against unconsidered, hasty attempts to introduce innovations placed emphasis on the conservative rôle of education in the noble sense, in transmitting content and also certain values.

But the feeling which emerged quite clearly from the debates was that there was a need for innovation as regards both content and methods.

Requirements stemming from new technology

Up until now education has been caught in the stranglehold of tradition; curricula in most countries are fundamentally inapt with regard to a knowledge of the technological environment, and equally irrelevant when it comes to vocational training, where knowledge is quickly outdated with the rapid strides in science and technology. Education in the broad sense, and training, will have to keep abreast of the new technology, and training must therefore be broader-based, more general, in short more versatile, however paradoxical this might appear to be when one considers the continuing trend towards specialization in the techniques employed. At the same time, there should be an effort to improve upon curricula so as to make them more appropriate to future technological and scientific requirements.

The increased and new demands made by technology on education should be anticipated in time so that they can be incorporated into curricula. Establishing the link between education and the demands of technology and science aptly summarizes the fundamental problem stated by the socialist countries. This viewpoint sees scientific knowledge as the central axis around which the learning process as a whole will be organized. A selection is made of basic knowledge which will be part of curricula, forming the core of fundamental scientific knowledge. Around this core are grouped non-durable branches of learning reflecting contemporary needs.

The pace of scientific and technological progress and change underlies this approach, which provides an initial level of basic science education leaving scope for any new or specialized subject that may be needed at a later stage to be worked into it.

The fundamental premise behind this approach is the paramount importance of scientific and technological progress within a conception of society seeking to equate man with the producer.

According to this view, education has two all-important functions to fulfil, which were in fact defined in the Soviet Union in the 1930s with the "historic decree" : (a) to provide the fundamental basis of the sciences, and (b) to teach people how to study, how to seek knowledge. The second point is a new approach in that emphasis is placed on the fact that the individual must be educated by being given the means to develop his creative instinct.

The problems involved in change are apparent in this twofold definition of the rôle of education since it implicitly points to the need to analyse attempts to modernize both content and methods.

Others took the opposite view, rejecting the importance of technology as far as future educational reforms were concerned and warned against any tendency towards "technological determinism" which holds that technology is what makes society and is hence the determining factor in social change. By attaching so much importance to the technological factor, such an approach might be harmful in that the cultural factor might be relegated to the rôle of a subsidiary force.

For this reason it might not be amiss to be cautious about any educational innovation justified solely on grounds of technological demands. Behind this approach we discern the demand for increased social responsiveness in education and greater equality of opportunity in both formal and non-formal education. Education has many functions and its task is therefore both to train producers and to strengthen pre-existing social structures. Educational change should be instrumental in questioning the existence of a single model in education.

In order to bring about such reforms, the first step should be to develop educational policies further on the basis of new formulations and analyses carried out by governments.

Socio-cultural factor

The inadequacy of education is also felt in regard to a knowledge of the living, directly perceived socio-cultural environment. The strong emphasis on tradition, history and dead languages has nothing in common with the fuller and often inadequately grasped dimensions of modern society.

Greater relevance to reality is called for and this might be achieved in a variety of ways such as, for example, introducing children, by means of appropriate textbooks, to all the structures, institutions, and so forth, involved in running a modern, industrialized society organized on the basis of a widely diversified distribution of functions.

Another good example is history, which might be taught "in reverse", thereby respecting the generation gap and bringing it out into the open. It is argued that there is an all too frequent tendency nowadays to think in terms of all-powerful 'knowledge' whereas actual experience, let alone learning about the relativeness of different spheres of knowledge is given no credit at all. Education should enable the individual to develop his ability to grasp reality, a spirit of enterprise and risk.

This might be the main thrust in curriculum development, instead of the present system of breaking curricula down into subject areas.

This argument thus rejects any idea of the rôle of education being one of 'reproduction' or 'transmission of knowledge'. Emphasis is placed on the development of the individual, to whom education should give the ability to 'free himself' from society, regarded as unsatisfactory but inevitable. Furthermore, educational change should be directed towards replacing 'linear' reasoning by 'macroscopic' or 'systemic' reasoning, and this presupposes learning in terms of 'time' (e. g. the ecological cycle or the development cycle). But we shall come back to this demand for systemic thinking and the debate to which it gave rise.

Approach in terms of goals and the principle of systematic learning

From a didactic point of view, this conception involves approaching education from the standpoint of goals and problems, stemming in part from a refusal to accept the present system based on the breakdown into subject areas. Although it was shown to possess different aspects, and was enlarged upon in the course of the debate, there was a broad consensus of opinion in favour of this approach as a pedagogical alternative.

The purpose of the method, which should be applied from primary school onwards, is to decompartmentalize knowledge and teach children to discover the pathways to knowledge for themselves. Its aim is to strengthen children's creativity by placing greater emphasis on teaching for the individual.

It is thought that the paradigmatic approach to learning prevalent today is harmful since it stifles children's capacity for personal development. From the moment children start school, they should be taught to develop their creative instinct, and this should be the golden rule in education.

In the emphasis on teaching by goals as a fundamental factor in developing a child's creativity, there is evidence of the long-standing debate on the antithesis between the idea of transmission of knowledge and that of intellectual discovery.

The approach in terms of goals was, however, defined anew : it should be combined with teaching by subjects,and not be the only didactic method, the purpose being to arrive at true interdisciplinarity in the learning process.

This reformulation was corroborated by an account of Soviet experience prior to the 1930s. The purpose of the method used in the projects at the time was to strengthen the correlation between education and real life. The main drawback in this method, as ascertained later, was that there was no systematic teaching of science. The method was consequently abandoned and replaced by another, giving the child the basic minimum knowledge he needed, on to which other subjects were grafted as circumstances required.

Systematic teaching should not be neglected. This approach stresses the close interdependence between content and methods, neither of which should take precedence over the other. Systematic teaching as a pedagogical principle also seems to be a way of solving certain problems concerning the transmission of a basic store of knowledge constituting a core for other, more specialized forms of knowledge to be incorporated later.

Criticism of the systemic approach

The proposal to introduce systems analysis with regard to the requirements of the modern world met with some reticence. With systems analysis, there would be a shift away from linear reasoning. It is therefore at one and the same time a way of acquiring knowledge, grasping reality and learning. The other advantage of systems analysis, as a way of acquiring knowledge this time, is that it is believed to be of considerable significance in going beyond certain limits set by traditional disciplines today. It makes it possible to assemble all the facts and consider the aggregate dimensions of a problem or an institutional structure, giving special consideration to time and space factors. Systems analysis does not, moreover, preclude the goal-oriented approach, which should be centred on what actually exists.

Systems analysis can even be seen as being a new skill, and there could be openings at several institutional levels for any person specializing in systems analysis.

The most clearly formulated criticism of systems analysis revolved around two basic points : firstly it was accused of being an attempt to universalize all the factors it dealt with; in education, for instance, it puts all children on the same footing, rich or poor. Secondly, and this is another side to its levelling and unifying effect, it presupposes a system exempt from any conflicting forces. This might easily lead one to infer that all the factors and aspects involved operate uninterruptedly and harmoniously.

Systems analysis has been refuted on the strength of another conception fundamentally opposed to excessive determinism through science. Scientific mythology, reductionism, over-quantification, ready-made solutions for everything and over-reliance on mathematical models of social systems have resulted in a mystical belief in a whole set of instruments deemed to 'represent' and explain reality. There has also been a blind faith in models as mirrors of reality. For centuries, education has suffered from exclusive reference to scientific paradigms, and students have been thoroughly 'brainwashed' in this respect. The problems are especially acute when it comes to applying quantification and reductionism to the analysis of social structures.

One could remedy the linearity of the one and only scientific model deemed to crystallize and explain reality by using multiple and different models. By multiple models is meant that conception not just of alternative mathematical models, but of non-constructed models with a quasi-technological perspective. All the more so since - and there was unanimous agreement on this point - qualitative analysis is as important as quantitative analysis.

Three education models

As a result, three perception models should be applicable to educational change so as to strike a proper balance between a nationalism regarded today as excessive and demands for globalization and for localization, with the individual himself as the ultimate point in the process. These three models are : (a) the social model, (b) the individual/communal model and (c) the global model. Since they can be used both for scientific inquiry and for all levels of education, these three models will be based on the following three approaches :

(i) The analytical approach seeking optimization or the best possible solutions. This is the traditional approach of the sciences.

(ii) The approach involving investigation of relationships, which may be compared to the work of the journalist, in other words analysing a situation from the facts rather than from documents. Information is sought through interviews.

(iii) The approach involving investigation of the 'time-space horizon', which tends to make up for lack of perception of a continuous process represented by historical development. This approach includes teaching about the world situation and is also a method of investigating alternatives for the future. In short, it is a new way of learning about spatial and temporal dimensions, which have hitherto been overshadowed by nationalistic approaches and an obsession with the present.

It follows that an attempt should be made to strike a better balance between reductionism and perception of the whole. But the actual way in which any education is organized argues against overall analysis. The problems are classified in terms of disciplines, from which they are dissociable. Hence, as a corollary of this organizational division of education, we have a corresponding classification of problems and lines of inquiry.

Need for an interdisciplinary approach

Furthermore, division into disciplines hampers the development of interdisciplinarity, the need for which has often been pointed out.

Although the type of interdisciplinarity most relevant to the various structures of education remain to be specified, a clear desire to do away with the traditional classification of subjects has become apparent. Does interdisciplinarity in this case bear upon the educational aspect in so far as it underlies the approach by objectives in which all disciplines are supposed to participate? Or is it directed towards real integration of the academic and methodological machinery of previously independent disciplines?

What is more, present administrative structures - e. g. the splitting up of universities into independent departments, teaching and research units, and specialist fields - constitute an additional administrative obstacle to any attempt at collaboration, if not integration of disciplines. It must be added that in cases of attempted interdisciplinarity what is usually involved is merely multidisciplinarity where two university departments co-operate in research and teaching.

B. INTRODUCTION OF INNOVATIONS

Resistance to innovation

Like any change, innovations in education are bound to meet with resistance. The problems which arise may result in the complete or partial thwarting of the purposes of any reform, be it concerned with subject matter, with the actual teaching process or even with the administrative side. Far from being an attitude stemming from the innate, resistance to change is the outcome of a whole prior conditioning process, itself largely due to education, to its structures and to the subject matter and knowledge it imparts.

Even the best educational reforms may thus meet with resistance sometimes difficult to overcome from parents, from educators and teachers, and from administrators.

The introduction of modern mathematics is a classic example of this. The refusal seems to have come mainly from the parents, who were opposed to a new type of teaching which cast doubt on the validity of the way in which they themselves had been taught.

Another all-important factor hampering and diverting or, in the case of adequate dissemination and training, sustaining innovation and change in education, is the attitude of teachers.

The rôle of teachers

The rôle of teachers as mediators and agents of reform is by no means negligible. Furthermore, it should not be forgotten that the education system is one of the more labour-intensive sectors of the economy and one in which the teachers are by definition masters. What is more, existing education structures have produced teachers for each particular level and hence a graded qualification structure for a teaching profession which will, if need be, fight to preserve its status.

It is not just a question of traditionalist'ways of thinking' obstructing attempts to introduce innovations in education, but of hierarchical structures and power relations within the teaching profession as a whole in relation either to other sectors of the working population or to the machinery of State. In many countries, teachers are inclined to be conservative, and this is a significant factor when it comes to introducing innovations. It is therefore of vital importance for each nation to analyse its teaching profession when it decides to carry out educational reform, be it only partial.

Another point to make is that teacher training is inadequate. It is a cliché to repeat the fact that primary school teachers are not properly qualified. Even though in some of the developing countries the qualification level could not be any better, given the overall shortage of teachers, equally serious shortcomings are also to be found in the developed countries.

Another aspect concerning teachers, especially university teachers, is the separation and compartmentalization not only between university departments but between the university as a whole and the political authorities, national or international. The fact that there is this gulf means that most teachers are unfamiliar with the workings and methods of the political authorities, and likewise governments are reluctant to consult people with job experience when framing their policies, preference going to experts. This is equally true of international organizations, which are no more willing than academics or researchers to make a practice of interchangeability. What is more, most teachers are distrustful, if not contemptuous, of international organizations.

Academics and teachers in general are consequently cut off from politicians, and though they may draw up worthwhile alternatives and practical proposals, there is no political follow-up. But the best teachers are those who are the best formed and the best informed in regard to what the future is likely to hold.

A concrete proposal has therefore been to bring about a merger between academic work and practical activity in a political authority, involving a fraction of teachers who would be responsible for marrying up overall knowledge and practical relevance by means of participation in decision-making on policy matters. The purpose would be to put an end to the existing gulf between the academic and political worlds, to the compartmentalization of knowledge and to rigid social rôles.

For a new-type education

The principle would be to establish a series of successively arranged working posts which would have the cumulative effect of forming the mind and personality of the new educator. The aim would be to absorb the educators in question into different posts and thereby gradually familiarize them with a way of thinking that is both normative and relevant to the theoretical level.

This proposal provides for certain consecutive phases which alternate academic practice and policy-making activity.

- Practical phase: Before obtaining a doctorate or other higher degree, the educator would be expected to serve a training period with an agency planning or applying policy decisions, or with an international organization of any level and in any branch of activity. The object would be to familiarize the educator with the realities of decision-making and policy implementation and to pit his previously amassed academic knowledge against policy matters in the raw.

- Academic phase: During the period of greatest scientific creativity (i. e. between the ages of 25 and 35), educators should be given an opportunity of elaborating their conceptions and ideas by teaching at a university, making use of the system of sabbaticals and generally enjoying university working conditions. This phase would include the publication of works and would considerably amplify their theoretical notions.

- Practical phase : The educator joins a body engaged in practical policy matters or another policy-making authority. The aim would be to compare their academic work with the realities of decision-making and policy implementation. Steps should be taken to define their status, and this would make it easier to integrate them into policy-making bodies. Their rôle would not be that of an academic rendering voluntary and external services to the administration but would hinge to a far greater extent on genuine integration. The teachers so incorporated would be compelled to see how their own normative conceptions stand up to the demands of a concrete policy and this would preserve them from over-idealism or dogmatism.

- Theoretical phase: Here the educator resumes his academic activity. Teachers could thus help to convey their own experience and knowledge to the new generation. They could also help to draw up new curricula, reorganize academic structures, revise and compile textbooks and just do ordinary research. Their return to the university should be organized fairly flexibly, which would enable them to improve upon their previous activities.

- Another phase would no doubt be possible for some of them: they could go back to work in the policy-making bodies.

This idea of alternate practical policy experience with a decision-making administrative body and academic activity - teaching and research - naturally concerns only a small proportion of teachers in higher education. The idea of their alternating between two types of activity does, however, despite present-day resistance and mistrust, provide a genuine alternative, removing the barriers between government and the academic world.

Learning society

With regard to the main guidelines for the development of education in the next two or three decades, the participants discussed the concept of a 'learning society', on which there was broad agreement. The development of all societies is based on knowledge and know-how. What marks off the present period is the very rapid expansion of knowledge. This makes it all the more necessary to provide the requisite conditions for a learning society.

In this context it was specified that a learning society should not ultimately produce a sort of universal mediocrity or put the fate of society into the hands of a small group of research workers. What is important is the spread of education among the people, involving the people themselves. It is this objective that calls for concerted action.

Two aspects of the question were raised in this respect.

(i) How are people to be motivated to keep learning all their lives, since the assumption of a learning society is that everyone will do just this? Furthermore, this is a political, socio-economic and cultural issue, one involving society as a whole, which alone can provide an atmosphere and conditions making each individual aware of the need to renew his knowledge on a permanent basis. A further point is that education itself should concern itself with the issue, and the best solution is improvement of the education system.

(ii) In view of the future needs of society, the prevailing concept of education will need to be radically changed. The action required would be: (a) to endeavour to extend non-formal education; (b) to focus interest on the 'learning' aspect of the educational process;

(c) to bring modern technology into the classroom on a wide scale; (d) to provide fresh answers regarding "how to get people to learn", "how to educate" and "how to inculcate values". The answers would need to be consistent with the dynamics of development and, in particular, rapid technical and technological changes.

CHAPTER IV
RELATIONSHIP BETWEEN EDUCATION AND TRAINING

In an examination of the present education system and the possible and desirable course of its future development, a debate on the relationship between education and training warranted special consideration, as we have pointed out elsewhere.

A. THE NEED FOR A NEW APPROACH

Crisis in the present educational structure

Today's division of the system into primary, secondary and higher education, inevitable though it may seem to be in the present circumstances, is regarded by some as a failure. But, just as the system itself is graded, so there are degrees of failure in the various formal education institutions, with the result that what we have in fact is a 'grading of failures'.

Primary education, in which the goal of universal enrolment has not yet been attained in most of the developing countries, involves problems of a different order for the developed countries, where they are mainly to do with the improvement of teaching and education and the reshaping of curricula.

But the main problem, if not a major catastrophe, seems to be secondary education, which is a course of study with several different outlets and the training ground both for working life and for the pursuance of further studies.

In the industrialized countries of the West, traditional formal secondary education, whether or not it is distinct from training for a job, as in the case in some countries, is currently the biggest problem in the education system. The lack of any connection or contact with everyday life only serves to increase the irrelevance of hidebound curricula, especially with regard to adolescents on the brink of adulthood. The problems of secondary education cannot be overcome by the straightforward application of alternatives such as discovery methods, deductive methods or goal-oriented or subject approaches. Psychological and teaching problems, problems of content and knowledge, problems of relevance to the economic or socio-cultural environment all make for a standstill situation in secondary education.

This is amplified by the fact that secondary education fulfils a variety of social functions. For some it means the end of their schooling, imminent entry into working life and a definitive break with any learning establishment, at least in respect of traditional formal education whereas for others it is part of a continuum, a link in between primary and higher education. There is, in fact, a dividing line between these two functions of secondary education, the termination of which denotes two entirely different things: for some a job and for others academic (and social) 'promotion'. For the former it is training and for the latter it is called education.

The above approach to the 'crisis' peculiar to secondary education covers the dichotomy between education and training, and the socio-political issue concerned here with possible equality of opportunity which the education system might be instrumental in bringing about in the future. At the same time, it implies a close look at inequalities before and after education, the emphasis being nevertheless laid on the 'product' of the system. The various educational functions which seem to be compacted within secondary schooling may give rise to a more searching reflection on future alternatives for education.

Any educational change in the future seems to presuppose a radical reform of secondary schooling, if not, as pointed out in the Europe 2000 material, actually doing away with it in its present form.

This dichotomy between education - in the sense of general training - and vocational training, as concretized in secondary schooling, gave rise to extensive discussion evincing several approaches with divergent lines of emphasis and proposals.

All these approaches showed up the potential implications for the education system as a whole and for higher education in particular when it comes to attempting to improve upon the system.

Demystifying knowledge

The intention behind the approach laying emphasis on the distinction between lasting knowledge - general education - and short-lived knowledge - vocational training - was to highlight the present questioning of growth and economic progress with their implications of unbridled production and consumption. Leading on from there, this approach stressed the concepts of freedom, choice, doubt, experimentation and even error, all of which notions should be an integral part of future education. Vocational training today, with the way in which it passes on knowledge and its absolute respect for the 'expert', raised virtually to priestly office, should be given a subordinate role since it cannot satisfy basic human needs simply through its recognition of man as a producer.

This approach centres on the demystification of knowledge as the determining factor in the system of education and transmission of factual items. Emphasis would be placed on forming the personality, as something possible only through education in the sense of overall training. Know-how and the transmission of know-how were regarded as side-issues which were short-lived and therefore susceptible of adaptation to the present.

Integrating education and training

The second approach rejects the idea of a distinction between general education and vocational training for future education. It argues that this contradiction, which has in fact existed since the Enlightenment -

the humaniora and the realia - and is one of the ambiguities to be found as much in traditional cultures as in Western cultures, cannot persist in the future. The cleavage between education and vocational training merely serves to carry over the defects of formal education to the working and social life of the population. Effort should rather be directed towards integrating the two types of education by formulating a global approach to education seeking to unite general knowledge with know-how, particularly since the present sharp distinction between the two considerably bolsters the one-sidedness of education (e. g. the education of man as a citizen is practically non-existent).

Education and training cannot be integrated through mutual superimposition of their present forms. What is needed is a remodelling of the education system taking into account all the social, political and economic factors involved.

According to this approach, it should be added, integration does not mean unification but a number of different options or educational alternatives within secondary education.

The proposed form of integration is formulated in terms of intermittent periods of schooling alternating with work. It is not a new form of learning that is proposed but alternate periods of training - education in the strict sense - and productive work. The procedures to be followed in bringing this about remain to be defined.

Alternance of school and production as a new model linking training and education is applicable to the education system as a whole and not just to initial qualification.

Too sharp a distinction between school time and production time was warned against: the practicalities of linking formal education and production did not seem to present any undue problems.

But, it should be asked, what kind of production is involved? Learning in a workshop with a simulated production process, or actually working in industry? The advantage in the former case would be more systematic instruction in certain technical processes; whereas in the latter, the pupil would be incorporated in a real working situation, an 'in earnest' situation in which he would have to shoulder responsibility and would become accustomed to the production process and the organization of labour.

It would seem, however, that the general trend today in both capitalist and socialist countries is towards unification, establishing a link between education and training. There are obviously several approaches to such unification which, even if they sometimes start out from the same premises - i. e., integration - eventually diverge significantly as to their implications for the structure of qualifications and for employment, and as to the procedures for integration adopted.

Polytechnical education: experience of the socialist countries

Polytechnical education in the socialist countries represents another approach to this linkage between school and productive work. It neither excludes nor replaces general education. Without being over-formalistic, we can say that the structure of secondary education - from the angle of institutional analysis only - resembles that of secondary education in the West in respect of its dual function of preparing the pupil for further studies and for working life. It remains all-important because, here too, it is the nexus between education and training. In this approach, emphasis is laid on conveying basic knowledge, and the purpose of current analyses and research is to update subject matter that is undergoing constant scientific and technological change, as well as methods, where the trend is towards heuristic learning.

The function of polytechnical education is to guide pupils and not to teach them an occupational skill; its rôle is to provide experience of social life so that pupils may choose their 'place in society'. It is organized in such a way as to provide pupils with basic knowledge and technological skills, in addition to such knowledge as is directly applicable to production.

With the latest reform, modern machinery is used in training so that the skills taught are relevant to those required in the production process. Attempts are being made to establish a better link between school and factory. One factory usually serves 25 schools, but each maintains a workshop for instruction in the various technical skills. In addition, the special subject areas are so organized as to provide a range of specialized skills covering each trade.

B. PROBLEMS ENCOUNTERED IN HIGHER EDUCATION

The ideological nature of the crisis

If, in fact, the predominant trend is towards establishing a link between school and production - despite the different forms it may take - this automatically presupposes the reorganization if not the remodelling of higher education, which may today be regarded as another 'failure' of the education system, at least for the capitalist countries. Student protest, including that of May 1968, is only one very partial token of this 'failure', which is the result of a more widespread ideological crisis concerning only students in some disciplines. It should not, therefore, be overestimated.

The dichotomy between education and training is found in higher education as well, although it has its own very characteristic features because of the traditional function of higher education, which is to impart supreme knowledge, and for that very reason affects only a relatively small number of young people. The dichotomy is nevertheless particularly acute in the actual - both vertical and horizontal - structures of higher education, in which the compartmentalization of disciplines and of diploma levels tends to lead to a gearing of the skills produced to the job market.

The increase in school enrolment, which has become practically the general rule in both the industrialized and the developing countries over the last twenty years, has meant - though in varying degrees according to the countries - people 'queueing up' in front of the universities. The 'social demand' for higher education has taken the concrete form of greater 'equality of opportunity' and 'democratization' and more generally available higher education, but higher education was still affected by the repercussions of the cleavage between the professionalization of certain disciplines and the humanistic acceptation of such education as being a moulder of the universal spirit.

However, in common with most young people finishing secondary school, those completing higher education are faced with the matter of finding a job.

There are a wide variety of problems involved in higher education, including the extent of its relevance to employment and to social demand, but also the sharing out of research and teaching, together with costs, organization, operation and so forth.

Policy regarding access to higher education

The decisive question, however, is what policy to adopt regarding access to higher education. Should access be limited in an attempt to correlate higher education outlets in respect of qualifications and employment, or a laissez-faire situation allowed that throws the universities wide open at the risk of subsequent graduate unemployment? Planners and politicians must face the fact that decision-making on education in general and higher education in particular is confronted with a set of factors, among which present and future employment is important, but not in isolation.

Considerations of political power relations remain uppermost in this case. There are thus two extreme alternatives. One is the complete liberalization of access to higher education (at least at the institutional level, for the hurdles of social origin and of selection will still be there), but it comes up against the problem of cost. The other possibility would be restriction in the form of explicit and institutionalized selection. For all its unpopularity, it would perhaps have the merit of channelling graduates to jobs which, in the case of market economies, would not be guaranteed but would at least exist.

For the planner, there is an evident dilemma quite apart from any moral considerations: in the former case, despite the appeal of individual freedom, we are up against the mechanisms of social and economic selection which, though lying beyond the classroom, are all-pervading. In the latter case, there is the danger that social and economic selection outside the school will only be added to, in market economies, by a form of selection peculiar to the school system, without any tie-up in return with employment opportunities.

Another alternative would be to introduce new institutional structures, such as the United Kingdom's Open University or the People's University in the Soviet Union, which could meet social demand by enabling people already in a job to retrain themselves and to acquire fresh knowledge or knowledge they never had owing to an excessively rigid education.

Similar attempts have already been made in other countries and might be extended to broader sections of the population. One possible alternative - for which the method has yet to be worked out - is the combination of work plus occupational experience and training. Working life would be alternated with training, which implies not only the reorganization of higher education but a complete change in its present functions, together with a radical questioning of present school and university studies. The reform suggested by that approach is a break between secondary and higher education as the best (and kindest) way of preserving higher education from overcrowding.

Problems regarding the introduction of changes

Establishing alternate periods of training and work raises a number of practical problems: (a) deciding upon the age at which people will start work and resume training; (b) deciding upon the type of work to be done during the first occupational period; (c) deciding what type of instruction will be provided during the second training phase.

This list could be filled out by questions concerning the choice of economically active categories qualifying for further education, the source of funding and costs in general, remuneration for that section of the population during the second training phase and, in a narrower sense, the question of deciding on the subject matter to be conveyed in this new type of training.

We can see that the dilemma of education and training does not allow any ready solution; the ultimate purpose of formal education has yet to be spelled out, and it can but be social. But what social purpose and for what society? The question is still wide open.

CONCLUDING REMARKS

During the discussion several other aspects were noted concerning future education. It must be added that all the proposals endeavoured to establish a relevant frame of analysis with a view to concrete change, which could only materialize through a deliberate educational policy. Such a policy might be provided either by national units or by international organizations, and the desirability of their acting together was highlighted.

What was pivotal in all the proposals, however, was the need for a conception of society as a premise for any definition of education and of its ultimate purposes.

Furthermore, the fact that the discussion encountered such dilemmas as that of education and training clearly shows that the weight of history is very great, at least as regards the West, and that similar dilemmas can only be overcome relatively, that is, localized in space and time.

What is more, recent decades have witnessed new factors disrupting whole societies. The consequent misalignment between a certain scientific and technological reality and a set of previously evolved ideas and theories hampers the development of an overall educational theory.

We still tend to think in terms of corresponding and contradictory factors, in terms of social needs and human needs and in terms of progression and regression. Before future education can cease to be future, it will clash with our sometimes fundamentally conflicting ways of thinking. May as broad a dialogue as possible help to overcome our limitations and so prepare a positive future.

PART II
WORLD TRENDS IN SCHOOL ENROLMENT AND LONG-TERM PROSPECTS FOR EDUCATIONAL DEVELOPMENT

CHAPTER V
DEVELOPMENT OF SCHOOL ENROLMENT: OBJECTIVES, RESULTS, TRENDS

In order to examine all the problems arising from the development of formal education throughout the world, and particularly in the developing countries, some participants proposed the systemic approach as a means of identifying imbalances and stresses within the formal education system. There was general agreement that the discussions would not be confined to the quantitative aspects of school enrolment but would also cover the qualitative problems likely to occur in the long term.

A. QUANTITATIVE CHANGES

Successes and failures

In the 1950s and 1960s, countries set themselves ambitious targets for the development of their education systems. Despite significant results, some disquieting trends came to light: several countries were unable to eradicate illiteracy, and the absolute number of illiterates in the world continued to rise; in some cases the enrolment rate too dropped or levelled out. It is estimated that only 62 per cent of children aged six to eleven years were actually at school in 1975. Unesco's forecasts for 1985 work out at around 68 per cent, which would mean a rise in the absolute number of children in the same age group not at school to 130 million in 1985, as against 121 million in 1975 and 110 million in 1965.

Population and school enrolment

It can be clearly seen from population trends that the target of total enrolment of children in the six-to-eleven age group presents considerable problems. In order to cater for the expected rate of population growth in the next two decades, the enrolment effort would need to be increased from 75 to 95 per cent.

Figures for Asia

This comparing of population growth with school enrolment produces spectacular results, especially in the case of Asia. With the present enrolment rate (70 per cent in primary, 33 per cent in secondary and 3 per cent in higher education), there would have to be 50 per cent more educational facilities and institutions in the 1980s and twice as many in the 1990s. Furthermore, some 200 million children aged six to seventeen years and 350 million illiterate adults will require education.

Uneven development of various education levels

Data on forty developing countries point to a tendency for uneven development as between the various levels of education. As a general rule, higher education developed faster than secondary education, whose growth rate outstripped in turn that of primary schooling. This tendency lends itself to different interpretations. On the one hand, it may mean that inadequate attention was given to development of the elementary level while the gathering speed of development of higher education made for greater inequality. On the other hand, owing to the fact that when they attained independence the former colonies had practically none of the highly qualified specialists needed for the establishment of new sovereign States, it was only to be expected that those countries should place special emphasis on the training of key personnel with higher education. Only a very close study of actual situations would permit a scientifically sound assessment of the causes of these imbalances.

Education of women

In some developing countries, it was a policy aim to reduce the inequality suffered by women where education was concerned. Some of the countries tackled the problem at the primary level, while others concentrated on the secondary or the higher level. This very apt policy was adopted for only a few countries, and the problem is still very serious in most. In Asia, for instance, school attendance by girls aged six to eleven represents only fifty to sixty per cent of the rate for boys, the illiteracy rate in the case of women being eighty to ninety per cent.

B. FINANCING OF EDUCATION

An alarming trend

There has been an overall trend since the early 1970s towards a relative decrease in public spending on education, particularly in the developing countries. This reflects a general change regarding the degree of priority at present given to this sector of national activity. In the developed countries the portion of GNP devoted to education has declined to a steady six to eight per cent. For the developing countries the corresponding figures are a little higher, but they are following the same trend.

It is generally felt that there are no grounds for believing in a return to the situation of the 1960s, when education had an unassailed priority in public spending.

Differences between regions

The situation is not the same in all the developing regions. Latin America is relatively more developed and could, around the year 2000, achieve the present enrolment rate of the developed countries. With regard to the financial outlay, this objective appears attainable with 5.5 per cent of GNP set aside for the development of education.

For Asia the outlook is less favourable. Two factors will influence the enrolment rate: first, the present rate is still low; second, the unit cost is also low. To take 2000 as the reference year, the Asian countries will not yet be up to the enrolment level of the developed countries, which will be 70 per cent higher. But even this objective will be attained by dint of a fairly heavy outlay of public funds.

Considerable effort in terms of public expenditure will also be needed in Africa if the enrolment forecasts for the year 2000 materialize. The outlay involved would be relatively greater for African budgets than for those of the developed countries, though the continent's enrolment rate at the end of the period in question would be lower than in the developed world.

General conclusion

There was general agreement among the participants on a conclusion set forth in a report submitted to the seminar. The passage in question read as follows: " ... it is vain to hope, in the absence of radical changes which are hard to bring about, for a significant increase in the productivity of education. For reasons quite consistent with economic theory, there is a tendency for unit costs to rise at the same rate as per capita GNP, so as to give teachers the benefit of overall economic productivity gains, to which they make only a marginal contribution. In other words, the quantity and/or quality of educational services rendered (and hence the enrolment rate) can generally only be increased if a greater portion of GNP is earmarked for education. The dilemma then is how to continue progress in the development of education in a context of rapidly declining elasticity of expenditure in relation to GNP."

C. QUALITATIVE ASPECTS

Two objectives

The discussions were mainly concerned with the objectives of education. The participants did not of course reach any consensus on this issue, and indeed that was not their aim. There was nevertheless broad agreement that two general objectives needed emphasis: the first objective was education for production and the second was education for what was termed the construction of society.

Criticism of education systems

In most developing countries, priority went to the formal sector, non-formal education remaining a rather marginal activity. The two sectors were not sufficiently interlinked. A certain "division of labour" was to be observed between those sectors, formal education being regarded as an instrument contributing to training for society and the individual, and the place of non-formal education being confined to training for production. Another shortcoming was that greater importance was attached to meeting the requirements of the modern and restricted sector of production while the interests of the non-organized sectors accounting for the bulk of the population were overlooked.

Outdated postulates

One of the assumptions of the 1950s and 1960s was that the development of education would make a decisive and automatic contribution to economic growth. This postulate can today be seen to be of very limited worth, and this has given rise to a certain amount of disillusion about the potential of an outlook for education.

The uneven development of education has called in question another assumption: that the accelerated and priority training of top specialists would contribute to economic development. Specialists do of course play an important part in a country's socio-economic and cultural progress. But the problem is that in practice, and for different reasons, trained specialists have swollen the ranks of the jobless.

The priority given to the formal education system was based on the idea that provision could in this way be made for the educational needs of the population. The fact is that even if the system is perfectly designed, it is generally not capable on its own of meeting all needs, particularly in view of their diversification.

CHAPTER VI
EDUCATIONAL DEVELOPMENT STRATEGIES

This critical analysis of observed trends in the development of education in the past and the diagnosis of the present state of education systems gave rise to a lively discussion on the future of education, its objectives in the face of fresh conditions and limitations, its shifts of emphasis in the decades ahead, and the need to change present strategies and give education systems fresh policy objectives. These were the main lines of the discussions.

A. A CHANGE OF STRATEGY

Responsibilities of countries

There is no single educational strategy that holds good for all countries. Furthermore, the strategy of a particular country, though reflecting its special historical, socio-economic and cultural features, should not be regarded as an isolated phenomenon having nothing in common with that of other countries.

National strategy must admittedly be framed by the country itself since its own essential responsibility is involved. Nevertheless, in the framing of this national strategy, an individual country could take account of certain components identified at the international level which would suit its own special circumstances and the objectives and prospects of its education system.

Using new conceptions of development as a basis

The education model or strategy adopted depends on the country's conception of general development. Changing this strategy means nothing short of attempting to formulate it on the basis of a new conception of development. The fact that in the recent past, development models in most countries of the world were marked by a certain pre-eminence of quantitative considerations reflected the conception of development based on the then prevalent economic growth objectives. Although these objectives have been attained (or almost), this type of development disregarded certain important qualitative tasks, such as reducing social inequalities and dealing with the problem of participation. An attempt is now being made to define development in terms of qualitative objectives. New educational strategies must therefore, in part, take account of this fundamental change regarding the conception of development. They must be aimed at contributing to social justice, at intensifying the move towards a more democratic society, and at promoting endogenous socio-economic, scientific, technical and cultural development.

B. NEW POLICY LINES

Developing non-formal systems

The participants were unanimous on, amongst other things, the need to further develop non-formal education systems, which exist in all countries but have received less attention than the normal academic systems. The idea is to give them the same priority as that enjoyed by the formal system, for under the conditions introduced by the new development strategies, education cannot be centred on the formal system. In this respect, one of the tasks should be to seek ways of legitimizing non-formal systems and broadening their social relevance.

Integrating the formal and non-formal systems

It is not a matter of simply broadening non-formal systems of education; it is essential to integrate them with the formal systems. The participants enlarged upon some ideas on how this could be achieved.

Firstly, emphasis was placed on the importance of an in-depth study of the various types of education in the world, and of countries' individual experience. International and national endeavours should focus to a greater extent on identifying and studying local experience, including both traditional and experimental forms of education evolved in various parts of the world. The purpose of the studies would be to determine such elements as might contribute to the changes to be brought about in the education systems.

Another step towards integration might be to convert school facilities into community resource facilities which, among other aims, would make for greater mobility between the two education systems. Wider use of the potential of voluntary associations might help to tighten the bonds between the two systems.

Lastly, reference was made to the rôle of the mass media in achieving the aim of integrating formal and non-formal systems, and of fostering international exchanges of a horizontal nature between the developing countries themselves. In this connection, it was suggested that the forms of such exchanges should be expanded to include not only research missions but also the intensification of joint activities by specialists from other countries carrying out on-the-spot studies of host countries' experience..

Comparative analysis of formal and non-formal education

One question in particular gave rise to a lively debate, namely the idea of making a distinction between formal and non-formal education in order to assess their relative advantages. Some of the participants contrasted the non-formal with the formal system, praising the former and castigating the latter. The other participants did not feel so sharp a line should be drawn between the two, especially as setting the 'advantages' of the non-formal system against the 'drawbacks' of the formal system seemed to be an artificial exercise. On the other hand, they stressed the need to dovetail the activities of the two educational models in question.

For example, there is no reason why the non-formal system should be thought to allow greater freedom or equality than the formal system. The fact that protest groups in a society claim they are the driving force behind a non-formal system cannot be regarded as a guarantee of the 'liberating' function of that system. The characteristics of both formal and non-formal systems are determined more decisively by the power structure in a society. And if in that power structure the protest groups advocating the non-formal system do indeed have a real, important part to play, then they are in a position to influence both non-formal and formal education. In other words, there would be nothing to stop them from taking action to democratize and liberate both systems.

The important thing here is not to go to the other extreme and blame all the shortcomings and failures of the past on the formal system and look upon the non-formal system as a new panacea which would free education from all the constraints it has to face.

C. DEMOCRACY AND RECEPTIVENESS TO NEW IDEAS

A basic contradiction

The contradiction does not in fact lie between formal and non-formal education, since both models can be either something that is imposed, manipulated, administered according to a set plan and allowing of no flexibility, or alternatively a source of creation, spontaneity, inspiration and receptiveness to new ideas. It is to be found in each of the two systems, indeed within education as a whole. What should be done, therefore, is simply to examine the prospects of these two approaches to education. Which carries more weight, which of the two approaches appears to be more viable as we set our sights on the year 2000? Which of the two, education the freedom-giver or education the alienator, will win the race?

Content of education

Here again the question arises of what to teach, the question of the content of education generally speaking. What should be taught, towards what goals for society and for education, in short, for what future? It was with this in mind that the participants developed the idea that the content of education should be governed by the concern to establish democratic, egalitarian education systems aimed at promoting the development of democracy and peace and the establishment of a new international economic, social and cultural order.

Desire for change

There was unanimous agreement among the participants that changes must be brought about in education systems. But to stress the desire for change would, in fact, be tantamount to raising a political issue. In other words, it brings us back to the question of the relationship between society and education and the changes in them. It is a problem that must be considered from a dialectical point of view, but with an attempt to avoid extremes: although the socio-economic and political environment determines the course education will take and by its very nature, education, too, has the power to contribute to social change.

This interaction between society and education could be easily observed in the process of significant political change. In this connection, the participants referred to recent experiences of important social change in several countries, opening up new prospects for democratic changes in education which in turn could, in this new favourable social context, show that it is able to influence the development of society.

PART III
THE CHANGING RELATIONS BETWEEN EDUCATION AND EMPLOYMENT

CHAPTER VII
DIAGNOSIS OF THE PRESENT SITUATION

A. INTRODUCTION TO THE GENERAL PROBLEM

Notion of qualification

While qualification for some is merely selection, with the consequent predominance of the social aspect, for others it implies definition of the abilities, know-how and skills required by the employment structure. Although these two dimensions are neither contradictory nor exclusive, the fact of taking either separately as being central calls for a different type of analysis, whose implications for the future are also different.

The starting point for reflection is the question of matching or, more neutrally, of relating education and employment.

The difficulty in linking education and employment - the possible difficulty in matching them - is held by some to be due to the fact that the employment structure is, at least at present, inegalitarian on account of the double indiscrimination between manual and intellectual work and on account of the selection and the power relations it introduces. From this point of view, any matching determined in advance would automatically mean selection and, to some extent, reproduction of existing discrimination. Accepting, within the existing employment structure, the correspondence of education and employment therefore means accepting, by means of an intermediate authority - the school - producing qualifications, the assignment of the population to a variety of economic and social rôles reproducing the prevalent hierarchical structure.

The debate on the relationship between education/training, skill structure and employment structure is furthermore extended by the present contradictory contentions on the trends towards 'over-skilling' or 'de-skilling' of the working population.

The need to redefine the notion of skill, as pointed out during the discussion on global forecasting models, should not hamper the confrontation of arguments regarding present trends.

Integration of education and training: Western experience

In accordance with the conception of integration of education and training, the notions of overqualification or 'over-skilling' (and consequently of 'de-skilling') and underemployment are not at present relevant. If one adopts the standpoint that the élite was always 'over-skilled', this conception places emphasis both on the extension of the notion of skill to abilities and proficiency beyond actual job requirements and on the mismatch of education and employment. This implies the establishment of new occupations for which the occupational profile would require another type of education. In this way, education would not be a path followed towards acquisition of a particular skill for a specific kind of work, but would be an 'open education' allowing of a great many applications.

This conception nevertheless calls for adjustments in regard to employment: the worker would have to be more mobile, more available, so that transfers of occupational skills could take place at a global level in order to forestall distortions and deficiencies in the requirements posted by the labour market.

Another argument in favour of a change towards general 'over-skilling' at the expense of any correspondence with employment is that such overqualification would bring in its wake a qualitative change in the organization of labour.

Integration of education and training: Soviet experience

The other conception, which holds good in the socialist countries and runs counter to the foregoing, is that maintaining the need for a tie-up between education and employment. This link must be permanently readjusted by means of economic and educational planning. Qualification or skill is a functional notion here both in relation to the school system and in relation to employment. This matching is only possible if secondary and higher studies are recognized as guaranteeing subsequent job placement.

Furthermore, what is involved is by no means an item-for-item and restrictive match; the purpose is to be able to foresee and plan the long-term needs of employment and of the economy by transposing them into educational terms. Thus the fundamental problem in the quest for correspondence is to combine the inertia peculiar to the very process of specialist training with the speed which will be that of the "scientific and technological" changes taking place in their activity or their work context.

The quest for a margin of flexibility through the rearrangement of certain qualifications into broader groups and by means of polytechnical education makes at the same time for greater freedom in carrying out adjustments between education and employment.

The importance of the 'skill' factor in this definition of qualification is therefore beyond question; just as the "scientific and technological change" factor as a determinant of such 'skill' must be synchronous, that is, mediatized by the school and put into practice by the production system. The 'duration' and 'rates of assimilation' dimension of scientific and technological discoveries are obviously fundamental in this case.

From this standpoint, the worker's qualification would be made up of know-how, of technical and practical proficiency, of technical skills, of basic scientific and technological knowledge and of renewable knowledge. The stages that are in the making consist of alternations of learning in general and special skills, with an effort to establish a close link. As to the standard of qualification, the trend seems to be upwards in view of the intellectualization of contemporary work in step with the technological advance of knowledge.

Planning of labour: three scenarios

In all societies over recent decades there has emerged an increasing emphasis upon manpower planning, and irrespective of the ultimate legitimacy of this philosophy (much hangs on the stage in the educational process at which this occurs as well as on its political proclivity), there are grave dangers if such 'planning' is amiss.

Now there occur, as will be discussed later, three rather different scenarios pertaining to the next two decades for different sectors of the world in relation to employment prospects: the Western developed world may, through a variety of demographic, economic, resource and technological-innovatory reasons be facing over the next decade(s) massive employment problems; the socialist states for other reasons do not complain of such difficulties; whilst less-developed nations, and in particular Asia, face continued or even a much worsening employment scene unless radically different policy measures are developed.

In the latter case, some would see the previous education policy, if not partly responsible for this demise, certainly not responsive in its present form to future social needs. In each case, whether Western developed nation, Socialist State or less-developed country, 'manpower planning', - and its education derivative - will have to be carefully assessed unless gargantuan errors are not to be avoided.

Duality of the education process

The education and training sector has to respond to immediate needs but it is also a society's major means of selective response to altered circumstances. More critically it may, given the chance, be the means of generating new circumstances - of shaping the social future. The education sector is one of the main means which societies have of encouraging a questioning of the past, of creatively catalysing alternative social futures. The social, economic and industrial pressures, problems and changes over the next two decades may for many nations be such that the formal education sector will be very hard put to respond, let alone adapt - and even less to exert positive influence upon the form of that change. And yet this is what is asked.

Projections of world unemployment by the year 2000 vary greatly - by many hundreds of millions - but they serve to give weight to the problems. In the mid and late 1980s various estimates of 'education-unemployment' for a variety of LDCs run into 80 or 90 per cent of the graduating secondary level, even assuming comparatively high economic-growth rates.

This is but one measure of a much wider world problem. Internal responses may take the form of labour-intensive policies; external response may be in terms of international redistribution of the terms of trade. But neither of these responses may be followed - they are only possibilities. Thus the long-term prospects for the development of education will depend as much on political response as it will upon analysis.

B. THE 'DEVELOPED COUNTRY' SITUATION

Changes in the standard and configuration of skills

The dominant trend of labour movement and associated occupational classification in the developed nations over the past century has been from the primary agricultural and mining sector to the secondary manufacturing sector, and in particular, in the last few decades, an extensive expansion of the so-called service or tertiary sector.

In parallel with this movement in labour there has been an allied development in the equipment and technology used, which has resulted in a qualitative shift in the pattern of skill requirements as well as a quantitative change in the labour profile.

In general the nature of skill demand has been such that whilst the vast majority of occupations have not been excessively taxing in terms of the demands placed on an individual (and therefore the form of primary- and secondary-level education has not significantly hindered economic and technological development), nevertheless as nations have become increasingly industrialized there has arisen an associated upward demand for professional and technological skills and manpower. On several occasions either there has been a real manpower shortage in relation to existing technology, or alternatively there has been a shortage such that appropriate research, development or implementation of new technologies, industries or services (e.g. teachers or medical) has been restricted. Alternatively there have been periods of temporary oversupply.

Such a view led to the manpower-planning philosophy which came to be an important consideration, despite its methodological and conceptual difficulties, (especially in 'mixed-economies') for the majority of industrialized nations.

However, besides this formal linking of the educational process and the form of industrial development which a nation either experienced or desired, there has also occurred in the last century, but more especially in the last few decades, an extensive increase in the provision of formal educational services. This has taken the form for most countries of the universalisation of primary and secondary education and a significant increase in the participation rate in higher education, thereby resulting in a more 'educationally-sophisticated' population.

The participation-rate in higher education varies considerably from country to country, as do the policy-directives which attempt to ensure an adequate provision of occupational classifications.

Polarisation of the concepts

The general expansion of education provision on the one hand, and the partial failure of manpower planning exercises on the other, has resulted in a range of problems pertinent to interplay of educational provision and occupational demand: e.g. the appropriateness of or 'matching' of educational supply and vocational demand; the overprovision of graduates; the undemanding nature of jobs, etc. Added to this there has occurred in some quarters a questioning of the 'human capital-economic benefit' equation.

Others, however, would take this as a very narrow view of education, seeing the educational rôle much more in terms of a social and humanistic framework and seeing economic 'benefits' as of secondary concern.

At a time like the present when education budgets have grown to a considerable proportion of total government expenditure, these various viewpoints as to the rôle and function of education - and the extent to which increasing provision will occur in the futre - often become increasingly polarised.

In many respects this has become particularly apparent with respect to education policy in the last few years and has come even more into focus as a result of internationally common demographic factors.

The down-turn in fertility rate which the majority of industrialized nations have experienced in recent years has led to significant reductions in teacher-training programmes, and, following the expansion of provision of education in the 1950s and 1960s, a partial scepticism as to the extent to which an expanded tertiary education sector can or should be maintained.

The extent to which current demographic trends are being used to 'rationalize' other policy determinants (e. g. inflation and a contraction of public spending; political containment of an expanded educational programme; scepticism of the economic benefits of increasing educational provision) is open to debate and is currently subject to a range of analysis and views.

The importance with respect to educational policy over the next two decades is critical, however.

'Educational' critique of the theory of post-industrial society

In several ways on-going developments in relation to educational policy do not correspond with one of the dominant parodymes for the future a few decades hence - namely the 'post-industrial society'. According to this view the industrialized and developed nations are moving towards an increasingly 'educated society', where continuous education and increasing participation rate in higher education become the norm. An informational 'college-based society' which is considerably in excess of our present experience.

Disregarding the suitability or otherwise of this future view of society in the developed nations, several pragmatic developments would seem to mitigate against it at present: unemployment, inflation, concern over future resource costs (and hence doubts concerning the rôle of future economic growth), non-expansion (and possible contraction) of certain aspects of formal education provision.

The immediate future, perhaps for the next decade, would therefore not seem to herald a post-industrial society view. To this might be added that if energy costs and availability, several decades from now, mitigate against capital-intensive and high energy-demanding industries and life-styles (including transport - a significant determinant of occupational styles in Western Society) then a return to labour-intensive occupations may occur with indeterminant effects on education policy.

Two occupational skill factors

However there are perhaps two factors which should be more carefully considered: firstly the effect of extended structural unemployment and secondly, the influence of micro-electronic and computing technology on the nature of future occupational patterns. and associated education and training requirements.

Let us first consider these separately, prior to assessing their interactive effect which may be more pertinent to future decades.

In the case of unemployment, which at present blights the majority of Western nations - and in particular those which are less competitive - present unemployment levels are variously seen as a temporary phenomenon due to a composite of demographic and temporary economic effects - in part stemming from the increased energy prices of 1973 and in part from a temporary over-productive capacity. Other analysts see the present trend as a structurally embedded problem relating to a range of economic, innovatory, resource cost and production forces which may well grow enormously in the future.

In the event of the latter being true, developed nations will be under increasing social and political pressure to examine in a more radical way than at present the nature of work distribution, the generation of labour-intensive areas beyond the present public sectors, and possibly to radically alter their policies in relation to time of entry into the work force, retirement age, and the extent to which there is transfer and re-entry from the education sector and industry. In short, there may be a future need for a fundamental restructuring of the workplace, of training and of the educational backcloth.

Effect of technological innovation on employment

This view is reinforced by some analysts who see in forthcoming technological innovations and their applications (the 'microprocessor revolution') the possibility in some industrial areas of massive employment shifts, of modification of skill requirements and of the replacement of whole industries by new technologies. The total aggregate effect on employment is as yet unknown, but if it is to increase unemployment. then compounded with the other factors mentioned earlier, a fundamental re-appraisal of economic, employment and associated educational policy may be forthcoming by the end of the next decade.

Some authors have suggested that this provides an opportunity for society to seriously address itself to the nature of the 'work ethnic', the quality of working life, the provision of new socially oriented services. Others point to the possible energy-saving, and materials-saving applications of the forthcoming micro-electronic age. Yet others point to the wide range of new skill opportunities and occupational classifications which may be generated.

At present it is not possible to accurately foresee the full technological or social consequences; however, it is almost certain that profound educational and training implications will follow. The extent to which such changes will be embedded in the general pattern of education as presently conceived, or will herald major discontinuities, remains to be seen.

As will be discussed later, however, the extent to which future industrial and economic policy in developed countries can be seen in isolation from developments in other parts of the world - to consider developed nations in isolation - is highly circumspect.

Transnational corporations and the employment problem

We therefore turn now to the over-arching employment and educational problems confronting the less-developed nations. However, prior to moving to this section it is perhaps necessary to isolate one other factor which is supra-national, namely the rôle of multi-national corporations. We see here both a bridge between international employment policy and a barrier to the effectiveness and autonomy of individual national policy. Some analysts have emphasized the increasing 'inflexibility' of labour markets - that large corporations and extensive unionization of the labour force may pose very real threats to the adaptive and policy re-orientation possibilities of developed and developing nations. The extent to which this is seen as a stabilising or dangerously unadaptive force is at present unresolved. Certainly an increasing inflexibility of the labour market presents problems for the education policy-maker. Similarly with respect to the manpower-planning philosophy and the attendant effects on education planning. Governments may have comparatively ready access to the education sector as a means of shaping supply; the demand-side, however, is for many economies further from their reach. Dependent upon the ideological framework and economic framework in which the analyst or individual places faith, there are both advantages and disadvantages to this dilemma. For those concerned with discussing the interaction of education and employment in future decades this of course presents major problems.

C. LESS-DEVELOPED COUNTRIES

In turning to the less-developed world and measuring the long-term possibilities in relation to education and employment we encounter a range of problems of a very different kind from those considered in the previous section.

The problem of unemployment pale into insignificance when compared to that found in the LDCs; the level of economic development bears little comparison; the scale of poverty and suffering is legend.

Goal of expanded education systems

Although the situation. problems and socio-political response vary in many important ways - although Asia, Africa, Latin America, South America have to a certain degree common employment and social problems, their differences are many. in particular in relation to demographic considerations and physical resources; nevertheless a more or less common response pattern to their socio-economic problems may be observed, namely a gargantuan expansion of their formal education programme during the late 1950s, 1960s and early 1970s, with an accompanying enormous growth in public expenditure (often in excess of 6 per cent of GNP), the prime aim being to achieve a pathway to self-sufficiency in relation to economic growth and welfare.

Bearing in mind the enormous task undertaken, the main strategy in many countries was to direct the main effort into secondary and tertiary education - to follow the 'manpower planning' philosophy in the hope of producing an appropriate technical, scientific, commercial enclave which could feed or catalyse a modern industrial sector. This is not to say that a massive parallel programme in relation to primary education and illiteracy campaigns were not undertaken; however, the dominant curricula and policy thrust was geared to the production of a modern sector.

Causes of the 'failure'

To a large degree the hopes of economic growth have not been achieved and even where there has been growth this has tended not to have resulted in a radical redistribution of wealth or occupation within less-developed countries.

This 'failure' may be attributed to a variety of causal factors: international terms of trade (dependency theories) which have hindered industrial development in relation to international competitivity; social problems related to urban drift and concentration; demographic problems related to rapid population expansion; indigenous socio-cultural factors and other 'local' reasons.

In the majority of cases not only has there been a grievious failing of hopes, but additional problems of 'educated-unemployment' have resulted on a massive scale, whereby a large proportion of secondary- and tertiary-level graduates have little hope of employment commensurate with their qualifications. Similarly the 'wastage rate' at primary-education level has remained very high despite improvement in teacher/pupil ratios, etc., perhaps not surprisingly when one considers the social and economic circumstances of the children's families.

From another standpoint - and in particular in relation to the education policy which in some countries is now beginning to emerge - it is important to recognise that the percentage of the total workforce which is in the 'formal sector' is often very small (for example in India less than 20 per cent: 20 million out of a work force of 220 million). Nevertheless the dominant modus operandi of the formal education sector was in relation to the perceived needs of the formal economic sector, despite the actual segmentation or dual-nature of the labour market.

It is now becoming increasingly recognised that for many nations the immediate needs of labour-market development, of national socio-economic and basic-needs development, point more to the form of the agricultural, rural and 'informal' sectors as a means of employment which is both labour-intensive and immediately appropriate to a variety of national social pressures.

This is not to totally negate the need for expansion of a variety of capital-intensive industrial sectors, but it is to re-orient the place of emphasis in national social and educational policy.

Educational reform and development policy

However it would be foolish not to recognise the large individual differences between nations, dependent upon the dominant national political powers, the dominant ideology and the nature of their physical and energy resources. In those countries where a major change in educational policy is envisaged (e.g. India) the re-orientation to this more labour-intensive, agricultural and rural-development programme heralds a range of important measures which may dominate education policy over the next two decades. For example, considerably more attention to the 'relevance' of education programmes to rural and agricultural development - and all the associated skill and artisan requirements; an increasing emphasis upon 'informal' training techniques, a re-allocation of resources to primary and secondary courses which are of a 'terminal' and culturally appropriate nature; a reduction in tertiary-education programmes which are of a more 'academic' nature, but not necessarily a reduction in the production of scientists, technologists, nutritionalists, educationalists, health officers who have skills that can be directly used in such programmes.

Allied with this is a great need for careful consideration of the form, organization and further development of 'appropriate technology' schemes.

However, despite the possibility of this redirection of policy there still remains, over the next decade or so, the problem that a large proportion of the secondary-school output (perhaps in excess of 80 per cent of the emerging cohort) will encounter severe occupational difficulties.

Similarly despite the 'forward thrust' of this overall educational policy there still remains an urgent need for illiteracy programmes for several hundred million adults - and associated relevant primary-education provision.

Relations between national problems and the NIEO

But to speak of all this in local national terms is to fail to recognise that over the next two decades considerable political re-orientation may occur both within and between nations which may fundamentally relocate the economic baseline, the trade-dependencies and ideological format within which they now operate.

Thus at one end of this scale land-reform measures in Asian countries may have significant effects upon employment opportunity, whilst more macro-consequences of the emerging forces associated with the NIEO may play a dominant rôle for many nations.

Similarly the extend to which national employment and educational policies may be able to function and develop in a comparatively stable environment, whilst other enormous social pressures resulting from the internal nature of distribution of wealth, of increasing rural drift and urban concentration, of population and associated resource pressures mount, is subject to considerable doubt.

As mentioned earlier, education policy, industrial policy, redistributive claims have to be seen in the wider framework of a nation's (or group of nations') social policy - and of the continuing will and ability to enforce such policy. The recent history of many less-developed nations has been one of violent social, political and ideological upheaval, and major reversals in policy have often accompanied such crises.

It is one thing to discuss a particular normative possibility, or even a range of possibilities. It is quite another to accurately foresee the real turn of events.

The way in which the North-South 'dialogue' develops over the next two decades will no doubt prove to be a not inconsiderable controlling factor of individual nation's progress towards social development. But an increasingly potential dominant axis which may carry many economic, trade and social developments is the emergence of a significant and influential South-South 'dialogue'.

CHAPTER VIII
CENTRE OF INTEREST FOR THE FUTURE

It is neither possible nor desirable to adequately summarize the extremely wide exchange of views which occurred in the discussions. Summary and integration, bearing in mind the range of political, social and ideological viewpoints represented in the group, would be to arrive at a 'lowest common denominator' effect - and much would be lost.

Far better to highlight the most dominant concerns, since to a large degree there was common agreement amongst discussants as to the major problems which faced those who are concerned with the interaction of education policy and employment prospects and developments in the coming two decades.

A. GENERAL EDUCATION POLICY FACTORS

As regards general education policy, discussion covered the following points - which sum up the principal preoccupations of the educational authorities. Some of these points are of more immediate concern to developing countries; others are perhaps of a global nature or more specific to industrialised countries:

- Recognition of the inappropriateness (and failure) of uncritical 'exporting' of Western education policy and philosophy to less-developed countries. This touches in particular on the nature of 'relevance' in education curricula and structures; it also pertains to the future macro nature of employment and especially the rôle of agriculture.

- A rejection of the Urban Development/Trickle-down 'theory' of social and economic development, and the need in relation to this rejection for an urgent re-appraisal of many countries' future education policy; and in relation to this but also of a more general nature, it should be recognised that there is an increasing awareness that 'education' is not a sector, but interwoven into the nature and fabric of society. From this are derived problems of entry, social filtering and the limitations and restrictions of education as an important social-change agent.

- That there is a possible failure, or at the very least fundamental conceptual problems in relation to the 'human capital approach' and subsequent reliance upon manpower planning. (In connection with this the extent to which policies in some developing countries relate to a minority of the population who are in the 'formal' or unionised occupation areas, whilst the vast majority remain outside the reaches of the formal economy, poses both dangers and difficulties at the level of national education policy.)

- A recognition that ultimately education policy can only be derived from social policy. As to the form of that social policy there still remains a wide range of views; and the fundamental problem arises that if to a large extent social change derives from education policy, many societies may be unwilling to accept that change.

- That many of the educational policy approaches developed over the past twenty years have failed in interfacing the 'output' from the education system with the wider social, cultural and socio-technological needs of particular countries. This may, in part, be due to the fact that despite the immense funding and expansion of the education-sector during the 1950s and 1960s, there was little fundamental redesign of institutional structures and functions.

- That following the expansion of the 'education' sector during the previous two decades, and the subsequent proportion of GNP now devoted to education in many countries, political pressures for a leveling of funding have to be recognised. However, the validity or legitimacy of arguments to restrict education budgets rests as mentioned earlier upon the social framework and social policies which purport to guide education policy. Thus the rejection or querying of the 'human capital approach' and the methodological and institutional difficulties and criticisms of the 'manpower planning' philosophy do not lead to arguments for the containment of education budgets. This is not to say that the form of education, its rôles and aims, should not be subjected to fundamental re-appraisal.

- In relation to the goals and rôle of education, the extent to which education systems do, or do not, encourage egalitarianism both as a fundamental concept and implicitly in the nature of the skill provisions afforded, was seen as of critical importance; the more so as the nature of employment (and unemployment) is subjected to increasing rate of change, stress-points and technological modification in the coming decades.

- Finally, that for several less-developed (and for some developed) countries education policy will be increasingly forced to recognise that in providing universal education programmes whilst maximum attention has to be paid to the 'relevance' dimension there is also an urgent need to resolve the form of a universal form of education on a socially acceptable ethical basis.

B. EDUCATION POLICY AND EMPLOYMENT

On the subject of relations between educational policy and employment, the participants' centres of interest covered the following questions:

- To think of full employment in the future, even in developed countries, becomes increasingly problematical if present trends are continued. Policy-makers will therefore be increasingly forced to consider 'social employment' and to radically review the educational implications of such policies.

- As the public sector continues to increase in importance, there occurs an urgent need to assess the form of skills which will be required and the rôle of tertiary education and graduate output in relation to the growth of the public sector.

-That the increasing segmentation of the market raises many educational policy issues.

Coupled with this segmentation factor, labour markets may become increasingly inflexible, with migration within industries becoming a dominant form of labour movement, by-passing the education sector and also presenting many problems for the education sector.

- That to some degree correlation between education and employment may be decreasing with each year - and in the next two years may be exceedingly so for less-developed countries.

- That from an employment viewpoint, for many less-developed countries the 'capital-intensive route' as a guide-line to industrial policy may be disastrous as well as energy-wasting. In this connection it was pointed out that increasingly in the future and in particular in relation to less-developed countries, policies should be geared to:

- appropriate technology development
- labour intensive occupation areas
- energy saving routes, and that many aspects of education and training should relate to these consideration.

- That a major deterrent to such developments lies outside national boundaries, pertaining more to international divisions of labour and the rôle of multi-nationals in establishing labour markets and industrial policy.

- In relation to research in these areas we might point to three urgent requisites:

(i) The rôle of education in relation to high levels of unemployment (including careful consideration of the nature of employment)

(ii) A disentangling of 'rhetoric and reality' : viz. in education: what is wanted, what is happening and to what effect?

(iii) Establishment of the nature of effectiveness of research itself.

C. EMPLOYMENT, EDUCATION AND THE FUTURE

Global dimension of the employment problem

The world as a whole is faced with a range of problems which impinge upon the employment prospects of individual nations, and in relation to this the vocational rôle or skill provisionary aspect of education.

The main factors which will probably influence future macro patterns of employment are the extent to which we encounter changes in the international distribution of wealth (as measured by productive capacity, technological development and human capital); shifts in the location of production (e. g. the continuing competitive emergence of labour-intensive industries in S. E. Asia or South America); or shifts in economic (and political) power as a function of agricultural, mineral and energy resources.

This is not to recognise that competitive 'disabling' factors (population size, socio-cultural factors, political stability) will not also exert influence. Nor is it to fail to accept that over the next two decades economic and political re-alignments (NIEO, N - S 'dialogue') will not influence the future terms of trade and local patterns of employment.

Limited choice of solutions

To a certain degree there are a range of polarities which influence any discussion of macro employment, the present and future degree of unemployment (which has to be seen in terms of an individual nation's overall social policy, coupled with the degree of manoeuvrability) and the likelihood of change.

These polarities include: the socialist versus capitalist ideology; the 'rich' and 'poor' nations; the developed and developing nations; the resource-rich and resource-poor nations; the capital-intensive industrial route versus the labour-intensive economy.

These dimensions cut both across and within nations, however the overall pattern of employment is entwined in their entrangled dimensions. A country may choose to maximise its employment by following a labour-intensive low-wage economy; equally it may follow a capital-intensive route, and possibly through a growth argument, coupled with a distributed wealth programme geared through the tertiary service sector, maintain employment in that way. Some countries have a choice of routes, others would seem to be more limited. Thus many developing countries may choose for a variety of socio-cultural reasons to follow a labour-intensive agrarian policy - the past two decades may have demonstrated to many developing countries the inadequacy of a capital-intensive route to the basic needs of their economy or alternatively the inadequacy of their competitive position as a function of certain world trade dependencies. This of course raises the whole issue of appropriate levels of technology, of technology transfer and of trade dependencies which circumscribe the future progress of developing countries.

Outlook for the developed countries

Assuming that if over the next two decades there are no major international conflicts which lead to essentially new socio-political alignments, then seen from this perspective the major employment considerations confronting the developed nations may centre upon the social construction of labour-intensive areas outside the present manufacturing sector, and/or a fundamental restructuring of the present notion of work, if not into a post-industrial or leisure society, into one in which an individual's social and human abilities come more fully into play. This may necessitate a radical change in the education-provision systems of developed nations.

Such changes may be primarily induced by technological innovations and rationalization procedures which are now becoming apparent in Western societies. This may also come about as a function of more competitive labour-intensive sectors from the developing world.

However, another controlling factor will be the availability and cost of energy. The labour-intensive economies of the developing countries may further induce a capital-intensive response from the developed nations; but the extent to which the necessary energy support systems will be available is not fully certain. Occupational structures may in two decades from now be as much determined by energy and resource considerations as by technological innovation or social engineering, with accompanying educational requisites.

Outlook for the developing countries

With respect to developing countries at the present time, problems relate more to the provision of basic needs and the further development of labour-intensive sectors. The extent to which increasing urban concentration and capital-intensive routes are appropriate or desirable is subject to much political and economic debate. Countries differ, or are divided, in the courses which they wish to follow. The extent to which, over the next two decades, education policy responds to, or activates, the various socio-industrial options is undecided. Much depends upon the political colour, stability and power of individual governments. Economic policy has to be seen, ultimately in the social framework and at the present time for many nations this is very much in a state of flux.

The NIEO and the problem of employment

What is more certain, perhaps, is that it is becoming increasingly inadequate to consider an individual nation's framework in isolation from world events - whether in relation to the EEC; to the Socialist States; the potentially emerging NIEO; OPEC or other international blocs. This philosophy is reflected in the emerging framework of UNESCO and of allied UNITAR projects.

It is partly on account of the terms of international trade and dependency factors that the massive investment made by many developing countries trying concurrently to provide themselves with higher education systems would seem to have had but limited success resulting solely in economic and industrial self-sufficiency. These commercial factors are of course the major concern in discussions on the New International Economic Order. And how this problem is dealt with in the twenty years ahead will perhaps essentially determine the level and form of employment in the developing countries and the consequent educational needs.

PART TWO

THE FUTURE OF EDUCATION AND THE EDUCATION OF THE FUTURE

Documents presented at the Seminar

THE FUTURE SHAPE OF EDUCATION?

by Lê Thanh Khoi

Forecasting, prospective analysis, futurology .... the proliferation of terms in the area of research into the future indicates the extent to which this has become one of the major preoccupations of our time. It has been said that "the art of government is foresight" and it is certain that political action, in the highest sense of the term, must or should - be based on a long-term vision of society as well as on a conception of the problems which could arise in the foreseeable future as a result of scientific and technological progress, population growth and economic and social conflicts. Man cannot change the past, but he believes he can influence the future and, to do this, he invents increasingly sophisticated techniques in an attempt to foresee what tomorrow has in store. The forecasting of economic and population trends was the first of these techniques, social and political forecasting being a more recent innovation.

Although forecasting will provide some idea of the problems ahead and stimulate the imagination, its prime function is to contribute to their solution, i.e. to assist the decision-making process. Otherwise, it would amount to nothing more than an academic exercise, an intellectual pastime. Decision-making, however, implies an ability to act. Thus, forecasting is closely linked with planning which is an instrument of government policy and this is the subject which we shall be dealing with here. Experience over the past thirty years, both at the national and international levels, has shown that not all forecasting is either meaningful or necessary. - if it is to serve as a basis for action, forecasting must be relevant. This relevance depends on three factors: (i) its national rather than global or even regional character, (ii) an accurate knowledge of the present and (iii) the distinction between variables over which some measure of control is possible and those where it is not - a distinction which depends on the capacity of the government itself, its economic and human resources and the nature of its political power.

A brief historical analysis will highlight the fundamental aspects of the problem.

1. Forecasting and educational planning

Educational planning grew up in the wake of economic planning. It made its first appearance in the Soviet Union with the preparation of the First Five-Year Plan (1928/1939) which made it necessary to programme the need for trained specialists: this meant therefore that there was from the outset integration of education within the economy, facilitated in this case by the collective ownership of the means of production and State control of the entire economic and social sectors. In the capitalist countries, the concept of economic planning gained ground after the Second World War with the need for reconstruction and modernization, the desire to prevent the recurrence of major crises, the creation of larger economic units and competition with the Eastern Bloc.

The need for educational planning, however, grew out of the explosion in the school population. Prior to the War, the situation in most Western countries had been stable as the result both of social conditions and a stagnant, if not declining, population trend: primary education kept pace with the birth rate whereas the growth in secondary and higher education, restricted to a privileged minority, was very slow. The annual budget appropriations were sufficient to cope with this regular but slow increase in the school population. Since the end of the Second World War there has been considerable expansion everywhere in secondary and higher education due to renewed population growth, the lengthening of the period of compulsory education and, above all, to an increasing awareness amongst parents that education opens the way to professional and social advancement. This has resulted in a corresponding increase in the budget for education both in real terms and as a proportion of national income and expenditure. The first planning bodies were set up to cope with all of these problems, e.g. in France, the Commission for School, University and Sporting Facilities was set up in 1951 within the Central Planning Authority (Commissariat Général du Plan) which had been in existence since 1946. Other factors were destined to enlarge the aims of educational planning and integrate it within economic planning. A particularly important factor in this respect was the competition with the Eastern bloc and the scientific and technological revolution: the success of the first Russian Sputnik (1956) triggered off research into the rôle of the human factor in growth which covered education, research and organisation in every area. Education, which hitherto had been thought of as a "consumer good", began to be considered more and more as a "capital good". The idea of planning requirements for qualified personnel gained increasingly wider acceptance, with the encouragement of OECD (Organization for Economic Co-operation and Development) which launched the Project for the Mediterranean Region and the Programme for Investment in Education with the object of assisting Member States to set up planning bodies.

In the Third World, the international organizations have played a major rôle in developing planning. The first plans attempted to satisfy the right to education set out in the Universal Declaration of Human Rights, e.g. a major Unesco project for the extension of primary education in Latin America was started in 1974. The failure of these partial plans soon gave rise to the concept of full-scale planning. Unesco successively drew up regional plans for Africa, the Arab States, Asia and Latin America. These proposed targets in terms of students, teachers, costs and methods of financing as well as qualitative improvements for each region as a whole, are designed to provide a frame of reference for national plans. These targets are not related to manpower requirements, the task of analyzing and forecasting these being left to the individual countries with assistance from the International Labour Office and the bilateral agencies.

It can be said that, over the past thirty years, the concept of educational planning has gradually broadened, going beyond the realm of schools and universities to include all forms of instruction and their relationships with economic requirements. In every case, forecasting has become an integral part of the process. What is more, the concept itself has evolved. It is no longer limited merely to drawing up a short or medium-term forecast on the assumption that past trends will continue - it has become conditional, i. e. it attempts to assess the possible effects of external decisions and events.

But, whereas in the 1960s planning was in its heyday, the 1970s saw its gradual decline. Except in the socialist States it has encountered more setbacks than successes, particularly in the Third World. In fact, too much faith had been pinned on it. By analyzing the reasons for this failure we shall be able to identify the conditions required for successful planning.

2. The unreliability of global quantitative forecasts

Take for example the Addis Ababa programme which aroused so many hopes when it was adopted by the African States in 1961 under the auspices of Unesco. The targets in quantitative terms set for 1980 were as follows: (i) free, universal, compulsory primary education, (ii) secondary education would be extended to 30 per cent of the children completing their primary schooling, (iii) higher education would be provided, as far as possible in Africa itself, to about 20 per cent of students terminating their secondary education (iv) the percentage of national income devoted to education would be 6 per cent.

A study carried out by BREDA[1] compared target and actual enrolment levels for 1970:

	Target enrolment	Actual enrolment
First level	71 per cent	46.2 per cent
Second level	15 per cent	6.3 per cent

The level of success achieved was 65 per cent for the first level and 42 per cent for the second level. But in addition, as the study pointed out, the disparities between countries and often between regions within the same country had increased, e. g.

- the level of primary enrolment in the different countries varied from 8.7 to 92 per cent;
- the annual average growth rate ranged from 0.3 to 11.8 per cent in the case of primary education, and from 3.4 to 28.3 per cent in the case of secondary education;
- the ratio of secondary enrolment to primary enrolment varies considerably: Rwanda 2.7 per cent, Malawi 5.1 per cent, Senegal 18.6 per cent, Ethiopia 20 per cent, Guinea 30.3 per cent.
- the proportion of national expenditure devoted to education in 1967 varied from 11.3 per cent to 23 per cent and the proportion of GDP from 1.4 per cent to 6.7 per cent.
- the per capita cost of primary education ranged from $18 to $126.

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[1] Unesco (BREDA), Document for the Intersecretariat meeting Unesco-OAU-ECA on the revision of the Addis Ababa targets (Addis Ababa, 12-16 September 1972), Paris, August 1972, (ED/WS/344).

Although there has been considerable growth in the numbers enrolled in schools and universities, there is no denying the fact that the programme was a failure. One of the reasons for this was that the basic situation had not been thoroughly analyzed. Targets had been established on the basis of considerably underestimated figures for the various age groups, rendered even more inaccurate by the subsequent growth in the population (at an average rate of around 3 per cent). The same is true of the "qualitative" reforms recommended by the Addis Ababa Conference:

> "That - as the present content of education in Africa is not in line with either existing African conditions, the postulate of political independence, the dominant features of an essentially technological age, or the imperatives of balanced economic development involving rapid industrialization, but is based on a non-African background, allowing no room for the African child's intelligence, powers of observation and creative imagination to develop freely and help him find his bearings in the world - African educational authorities should revise and reform the content of education in the areas of the curricula, textbooks and methods, so as to take account of African environment, child development, cultural heritage and the demands of technological progress and economic development, especially industrialization";

There is no doubt that there have been some minor reforms, in particular a greater emphasis, African history and geography, but generally it can be said that, except in Guinea and Tanzania, there has been no fundamental change in the system of education itself, which continues to mimic either the British or the French model.

As for the linkage with the economic environment, this is practically non existent. The expansion of education, which was not accompanied by a parallel economic development, has created an increasingly serious problem of graduate unemployment (not to mention the even greater unemployment amongst those who did not graduate, because this growth, unaccompanied by any improvement in standards, has also increased wastage in terms of the number of dropouts and repeaters). What is more, at the time of the Addis Ababa Conference, economic development plans and manpower surveys scarcely existed.

From this and other experience, we can draw the following lessons:

(1) The failure to achieve objectives is in part due to inadequate knowledge and analysis of the basic situation.

(2) When the targets were calculated for education, no similar calculation was done for the factors likely to affect this education, in particular economic and financial factors. (Only a forecast of capital requirements was worked out).

(3) Statistical forecasts on a world basis or covering large geographical regions are always inaccurate (which is of minor importance), but most important of all they do not take into account the wide disparities which exist within a region (let alone within the world). In fact, no region is uniform and no one country has exactly the same problems as its neighbours. Within every region there are very substantial differences in population growth rates, enrolment levels and per capita income, all of which implies different kinds of policy and different methods of financing. For example, in Latin America the population growth rate for the period 1960/1969 varied from 0.9 per cent in Barbados to 3.8 per cent in Costa Rica (average rate: 2.9 per cent). In Asia and in Africa

south of the Sahara, per capita income ranges from $200 to almost $3,000 (Gabon, Singapore). Gabon, despite the "wealth" represented by its oil and its small population, is faced with very serious problems of quality and inequalities which it has not succeeded in solving.

(4) Quantitative forecasts, which are arrived at (as happens in most cases) by projecting past trends, are of little value. Mostly, they tend to prove facts which the government is well aware of e.g. that the school population cannot continue to expand indefinitely at the same rate, that there are limits to the growth of expenditure, that unemployment will continue to increase, and that education does not necessarily imply the right to a job.

Long-term forecasting based on extrapolation never makes allowance for the reversal of a trend.

(5) Lastly, the disadvantage with statistical forecasts is that they focus the attention of governments on expansion in quantitative terms to the detriment of other forms of education, and do not take account of internal inequalities, i.e. inequalities between the sexes, between regions, between rural and urban areas, between ethnic groups, and between social classes.

Does this mean that long-term forecasting is of no value?

3. The value of "qualitative" forecasts

A government's policy should be based on a certain vision of the future and it might even be said that it is this vision which gives policy its meaning, for, without it, policy becomes merely reaction to outside events. Forecasts on a world-or regional basis are valid if they allow this policy to be positioned within a series of conditionals, i.e. possible futures, particularly when these include factors beyond its control.

One interesting method of social forecasting is the Delphi method. It consists in asking a group of experts, on a mutually anonymous basis, for their opinion on the probability of future events or trends over a given period; then, using an interaction matrix which takes into account a large number of variables and evaluates the possible interaction between the different events, a number of variants for the future can be worked out.[1] A more simple approach is to bring together a number of experts to discuss a common problem and attempt to identify future trends. As an example, one can quote the conclusions of a seminar organized by OECD in 1970 on the subject of "Curricula for Secondary Education in the 1980s and onwards." The Member States are in fact faced with the same problems and affected by the same trends. The approach adopted was first of all to review the factors which would influence the planning of curricula and then the changes which would ensue in the various subject matters.

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[1] IIEP, Management and decision-making in educational planning, Paris, 1970.

The factors which will influence curriculum development are: political (pressure to provide greater equality of opportunity), economic (the need for a more adaptable labour force in view of scientific and technological progress), and social (students' demands for curricula which correspond more closely to their interests).

The outcome of this will be that traditional subject matters, hitherto taught separately, will in the future be more closely integrated with one another. These changes in content will be accompanied by a greater degree of flexibility in the time-table (more emphasis on individual study and group projects), and by a change in the rôle of the teacher whose function will become less that of a teacher and more that of an organizer of the learning process, adapting this to the needs of each student and evaluating results. New types of premises, equipment and material will be necessary. The school will be of the comprehensive type and increasingly part of the community, which will participate in its running, use its premises and facilities and act as a source of information for all kinds of school activity.[1]

These conclusions were reached in 1970. The fact that they are still pertinent today demonstrates the validity of the approach. To revert to the concept which we put forward at the beginning of this study, this pertinence is bound up with an accurate analysis of present trends as well as with the capacity of governments to translate this into action (even if the economic crisis, which was unforeseen, has slowed down this process). These are the two aspects which we shall now go on to examine in greater detail.

4. Forecasts of the future and knowledge of the present

Any forecast of the future presupposes an accurate knowledge of the present. Otherwise, one is projecting shortages or surpluses into the future. Everyone is aware that, in the employment area, before making any forecasts, one must first of all make a critical analysis of the current situation. The differences between requirements and present employment levels may be the result of shortages or surpluses: (i) posts unfilled due to the lack of qualified personnel; (ii) posts filled by insufficiently qualified personnel; (iii) under-employed personnel. The company or the government service could operate with less staff, but is prevented from so doing on social or political grounds or by labour laws. It may also be the case that they are keeping their staff with a view to future expansion or, lastly, that they lack the required organization and techniques to make full use of their capacities.

In a situation of this kind, an extrapolation of past trends or any other technique would do no more than project unnecessary labour 'requirements' or 'requirements' for insufficiently qualified personnel.

By the same token, in education, one frequently comes across enrolment projections which do not take into account any possibility of improving the present situation. Everyone knows that the enrolment figures include a certain number of repeaters. Projecting total enrolment also means projecting the number of repeaters, in other words, one assumes that the system will not improve. This hypothesis is certainly a plausible one, but it needs to be stated explicitly and, what is more important, substantiated. But to substantiate it means that one has analyzed the wastage factors and assessed the importance of each. However, one sees researchers and organizations devoting years of their existence to describing wastage using increasingly refined techniques, without ever attempting to explain it in anything other than a general and superficial manner. What is the most important factor in wastage? Is it the qualification of the teaching staff? The number of pupils per class? The fact that the children are suffering from malnutrition? The fact that they have to help with the work of their parents? The distance between home and school? If the relative importance of each of these factors was known, then one could attempt to deal with them in order of priority.

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[1] OECD, The nature of the curriculum for the 1980s and onwards, Paris, 1972.

These are two simple examples of how wrong a forecast can be when it is not based on an accurate knowledge of the present - not only knowledge of the situation of course, but also knowledge of the factors affecting this situation. One could list many other areas where better knowledge would lead to better use of existing resources (national, regional and international) and a greater democratisation of education (since this is the word on the lips of every government), e.g. analysis of teaching contents and methods; the linking of education with the national culture(s) on the one hand and with production on the other; the opportunities for non-formal education and instruction by non-professional teachers and the lessening of cultural dependence on the outside world resulting from the use of imported educational material and techniques. Not to mention those areas where one is merely content to regurgitate the fashionable phrases of the moment, without any serious thought as to the underlying realities (or myths): what, for example, is 'cultural identity' ? What is meant by 'endogenous development' ?

It is of course possible to foresee something happening without being able to explain it, basing one's reasoning on its regular occurrence in the past, but a forecast such as this will always be of a general nature and, as soon as one attempts to put figures to it, one can be sure that they will be wrong e.g. one can forecast that there will be students repeating grades, without being able however to estimate their numbers accurately. But the fact of forecasting that there will be repeaters means, or should mean, that everything will be done to reduce their number. To forecast the same rate of repeating implies that one has rejected the possibility of taking some form of action - it is an admission of defeat.

Insofar as a real attempt at co-operation should be developing at an inter-regional level or, in a more general manner, between developing countries, one can look at the conclusions of the regional ministerial conferences on education organized periodically by Unesco. Thus, in Latin America for example, where the majority of countries have achieved universal primary education, the accent is on the reform and democratization of secondary education. Asia is concerned with the teaching of science, technical training and education in rural areas. In Africa and the Arab States priority is given to three objectives i.e. democratization (including the education of girls), cultural identity and education's contribution to development. To my mind, it would be more meaningful to study these problems from the viewpoint of international co-operation (i.e. study the experiments already carried out - the successes and failures and the reasons for these - so as to avoid a repetition of the same errors) rather than devote one's energies to unproductive exercises in forecasting.

True, it is easier to formulate equations and solve them with the help of a pet computer rather than to analyze the real problems of education in depth and in all their dimensions, i.e. political, social, cultural and economic as well as psychological and pedagogical.

5. Forecasting and capacity for action

The future is cloaked in uncertainty. Present resources are scare and, what is more, for many small countries whose revenues derive from their exports, they are subject fo fluctuations in the international markets. Education, like any other activity, requires financial support. One needs to distinguish two things: first, the State's capacity to influence the future and secondly, those variables on which it is able to exert an influence.

In this connection, one needs to draw a distinction between socialist countries, industrialized capitalist countries and those on the periphery. In each of these categories, the more sources a country possesses and the less it is tied to the international economy, the greater will be its capacity for action. A simple classification of countries into groups according to their levels of enrolment is of limited value.

(a) In the socialist countries of Europe, America (Cuba) and Asia, the collective ownership of the means of production and the centralized control of economic and social activity gives the State a greater chance of achieving its objectives than in the capitalist countries where the major part of economic activity is in the hands of private firms. However, such countries are also subject through their external trade to fluctuations in the world economy, as was evidenced by the recent spread of inflation on an international scale. Nor is State action without its limits in the area of education in view of the individual's freedom of choice. Despite its long history of planning, the Soviet Union has not solved all its problems, e.g. towards the end of the Fifth Plan (1950/1955), at the time when the training of specialists was beginning to equate with requirements, "a comparative surplus was recorded in some disciplines and, inversely, a scarcity in others".[1]

(b) In the industrialized countries of the West, despite two centuries of expansion, capitalism has not put an end to crises and recessions. What economist foresaw the 1930 crisis and, more recently, the oil 'crisis'? The acute unemployment in these countries over the past few years has had repercussions on education, particularly higher education where enrolment is no longer increasing as before and in some cases is even stagnating or declining.

(c) The rise in the price of oil created a rift in the Third World between those countries which possessed this raw material and those which did not. Those without it have become poorer and have difficulty in coping with the problems with which they are beset. They are the ones with the least influence over their future. Their resources depend partly on external 'aid', their activity depends on multinational companies and part of their qualified personnel are foreigners - this triple dependence is evident in the social as well as the economic sphere. If one takes Africa where this dependence is the most marked, it is not uncommon to find countries where foreign nationals comprise 50 per cent to 60 per cent of the teaching staff in secondary and higher education or where 40 per cent or 50 per cent of the budget is supplied from outside sources. The dominance of foreign companies is evidenced by the import of elaborate production teachniques which economize on labour but not on capital, and by a job hierarchy where the senior positions are reserved for foreigners. These few facts are sufficient to show that, for these countries, in the words of Bertrand de Jouvenel, the future controls rather than being controllable.[1]

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[1] IIEP Planification de l'éducation en URSS, Paris, 1967, p. 318.

Such then are the fundamental causes which explain the failure of most of the plans in the Third World. It is impossible to carry out the plan because the governments can exercise little influence even on the present, let alone the future. Democratization cannot make rapid progress because secondary and higher education are expensive, because the budget is limited (particularly when large sums are earmarked for the army and the police force), and because the privileged classes intend maintaining their privileges. Those leaving the schools and universities - not to mention the others - find increasingly fewer job opportunities because the State can only provide positions in the government service, which has now reached saturation point, whilst the economy is predominantly controlled by outside decision centres whose interests more often than not do not coincide with those of the country. The following declaration, made on 30 November 1976 by the Venezuelan Minister of State for Planning, shows that even the oil-producing countries, i.e. the 'rich men' of the Third World, are aware that imperialism hinders their development:

> "All the development plans which attempt to implant a new concept of the creation of wealth within the structure of society are thwarted because, within this social structure, they come up against the obstacle of powerful forces which are opposed to its best interests or which attempt from the outset to prevent them from being fully implemented. So long as there is no better distribution of power within society, it will be impossible to put into effect development plans designed to benefit the vast majority of the population. . since the country does not exercise control over the basic factors in economic decisions, which are in the hands of the multinationals which control both investment and the financial resources, and can thus neutralize the most progressive policies proposed by the democratically elected government of Venezuela since 1968".

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[1] B. de Jouvenel, L'art de la conjecture, Paris, 1964.

CONCLUSION

To sum up, it is our belief that, if forecasting is to assist in policy-making rather than becoming a pure academic exercise, it must operate within a national framework and be based on an accurate knowledge of the present. Statistical forecasts on a world or regional basis (e.g. Africa, the Arab States, Asia and Latin America) are devoid of any value, unless they serve to stimulate international co-operation. But recent experience has not been encouraging in this respect since the share of GNP which the wealthy countries allocate to such co-operation has declined continually. On the other hand, in a sub-regional context and for countries faced with common problems, benefit may well be derived from a forward-looking analysis of the conditions which would enable the functioning of the educational systems to be improved, in particular with regard to their democratization, reform of the learning process and reduction of capital and operating costs, with the help of the experience of other countries and the views of the future of sciences and technologies which could influence education. Even if the country does not control all these variables, forecasting and planning are essential because they given direction to its policy.

EDUCATION FROM THE VANTAGE-POINT OF THE YEAR 2000

by Gilda L. de Romero Brest

I. Introduction

The Latin-American World Model[1] is an essentially normative futurological study: 'not concerned with predicting what will happen if mankind's present trends continue, but with pointing a way to the goal of a world free from ignorance, poverty and injustice'. It starts from the affirmation that reality and history are not shaped just by chance but by man's determination, though recognizing that there are conditions and restrictions, contingencies and hazards.

It thus admits that a variety of alternative futures can be depicted responding to the circumstances and aspirations of the community, and that for the scenario chosen, it is possible to programme, implement and monitor actions leading to the desired state of affairs, regarded not as a final goal but as a conception which must be constantly reworked as history proceeds.

The future proposed by the model is that of a society which is not consumer-oriented, but pursues equality, justice and self-reliance in its social, national and international dimensions, based on the inalienable right to liberty and on universal satisfaction of basic needs as required for a decent quality of life, achieved and sustained through broad participation in decision-making and control over all questions of common concern.

Its authors believe, moreover, that for the 700 million living in poverty, the nearly 500 million suffering from hunger, the several million threatened by disease and a low expectation of life from birth, as for the 800 million illiterates, catastrophe is no future threat but the defining feature of their predicament today. Confronted by these intolerable realities of inequality and injustice, they offer the blueprint for a new society and claim to be able to show that it can be viable within a reasonable time horizon.

The Latin-American World Model sets out to show that the central issue confronting mankind today is not the limits imposed by the physical environment upon exponential growth in the population, but the socio-political order, deriving chiefly from the unequal distribution of power. It could broadly be said to approximate the thinking on which the quest for a'new world order' is based.

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[1] By the Bariloche Foundation (Argentina). In a non-technical version it has been published as 'Catástrofe o nueva sociedad? ', by P. U. F. 'Un monde pour tous', Paris, 1977; S. Fischer Verlag 'Grenzen des elends', Frankfurt am Main, 1977; 'Catastrophe or New Society'(in Japanese, Diamond, Tokyo, 1976; 'Catastrophe or New Society' . I.D.R.C. Ottawa, 1976.

One of the central assumptions it examines is that population growth can be adequately controlled through satisfaction of basic needs, whose achievement can be taken to appear in a prolonged expectation of life at birth as the key indicator that the aims being pursued are fulfilled.

The needs regarded as basic are food, health, housing and education. It is argued that education, like the others, is a continuing need throughout the lifetime of the individual while also being a continuing need for society.

The continuing need for education is linked with a concept of man as agent for change in the uninterrupted process of constructing the desired future. The rapid obsolescence of the implements at his disposal with which to deal with unprecedented situations, and above all, the need to create and obtain the requisites for innovation, all point to the need for continuing overhaul of the resources on which the structuring of behaviour depend.

Thus, in the society they predict, both change and continuing education are institutionalized; however, change is not viewed merely as an aspect of given reality to be reckoned with in order to cope with its requirements, but as the central outcome to be sought and brought about through society's endeavour. It follows that continuing education is not seen as an activity which is necessary in order to keep updating the implements required for adaptive conduct: the desirability it postulates of broad participation in the creation of the future, generates the need for constant acquisition of knowledge, capacities, skills and attitudes to make such participation possible. This means that continuing education is not conceived as a consequence but, to a substantial extent, as one of the conditions for sustained change in the direction desired. Hence, traditional education which aimed to adjust its recipient to the existing order, must give way to a form of education designed on the contrary to disadjust its recipient, aiming chiefly to liberate and develop the capabilities and skills with which to stand away, take a clear, critical, aware view of the facts, processes and social mechanisms which give rise to unsatisfactory situations and obstruct the way towards the preferred society; to formulate criticism and dissent in terms of alternative solutions; to gain strength, knowledge, capability and confidence in one's own resources, self-reliance, to enter wholeheartedly with others in creative deeds so as to transform the situation in the direction of a decent, generous quality of life for all.

Uninterrupted participation in the social endeavour thus feeds the need for continuing education. The model postulates an education policy in which continuing adult education receives the same degree of priority as initial and basic education for the young. This policy is based on recognizing the legitimacy of the permanent right to education in order to be able to participate effectively, and on recognizing the rôle of education as a strategy for change.

But as well as being prolonged in its time dimension, education as anticipated would be amplified and diversified: it would remain in contact with the amplitude and diversity of the problems of insertion in the human ecosystem. Then the broad life anticipated would be at all times involved in active participation in the plurality of spheres of which this ecosystem consists. Responsibility on this scale will require wide, diversified capabilities and skills to take decisions, to programme, implement and monitor measures affecting the bio-physical and socio-cultural environment.

Education must therefore supply what is necessary to confront the problems associated with the natural environment, the necessary resources to sustain human life and activity, how it can be properly used and preserved; and the problems associated with the socio-cultural environment in its various spheres: political, work and production, employment, community, family, social communication, culture, sport and leisure.

To summarise, what the model proposes for the future society is 'Continuing eco-education'.

The model claims to be able to prove that a project oriented towards satisfying basic needs at the minimum levels compatible with the quality and dignity of life for every human being is a viable project, because its underlying philosophy is to set little store by mere quantitative growth and instead, to put the emphasis on quality.

In the society it projects, the educational policy based on elitist principles which supports the distribution of educational benefits, services and goods to those who hold power, is replaced by a policy based on the right to exercise power to generate, use and benefit from educational opportunities.

In the attempt to achieve equity, both intergenerational and intragenerational inequalities must be overcome. With respect to the first, the crucial question becomes one of ensuring an equitable distribution of opportunities between young people and adults. In the first place, not only because the educational privilege currently enjoyed by the young constitutes a notorious point of inequality, but also because the social projects, to be successful, require a continuing requalification of the adult generations responsible for implementing them. From this standpoint it is inadmissible to regard adult education as the benevolent conceding of a second opportunity, limited to making good the deficiencies of initial education or restricted to mere updating of vocational skills so that the person concerned does not lose his job. Compensating, and updating earlier training, are regarded as necessary but not sufficient; the sights are set on a continuing educational enrichment and advance, to move from the learning stage to innovation or creation in all fields of social endeavour, and of personal and group fulfillment.

Up to now, attempts at democratization have basically sought to close the gap of intragenerational inequality among the young, and strategies have been oriented towards the school system, widening supply and liberalizing access to the various levels and branches. The model proposes that these be extended, and assigns similar priority to chances of staying on and succeeding in the school system during initial childhood education, and then, of access, staying on and success in the overall system of school and out-of-school services, formal or otherwise, throughout the lifetime of the individual. This means that a guarantee of effective equality would be offered to the whole population, irrespective of age, giving practical effect to the deferred right to education and by the same token, enabling that right to be exercised not only in the formal system, but in the out-of-school non-formal and informal education services. It suggests a pattern, equally applicable to the young and to adults, of multiple opportunities, open and unrestricted, and also of equivalent quality and level. To implement such a proposal, far more is required than announcing a deferred right to education to 'recur' on the basis of the principle of 'alternation' (alternating between study and working or some other activity). It requires measures to overcome the need to 'negotiate' the moment at which the right can be exercised, and also measures to cover the 'opportunity costs' which could ultimately be expected, by means of a social security service for the whole population.

The equality of opportunity called for goes beyond the internal efficiency of an expanded education system to indicate that it must be efficient externally, in terms of the egalitarian qualification it can dispense in acceding, satisfactorily performing, and moving easily within the system of social and occupational positions and situations.

With regard to occupation, importance attaches, on the one hand, to the possibility of potentiating capabilities, to increase the social and individual productivity of labour. On the other hand, there is no exclusive interest in acquiring the capabilities required for the occupational structure as it exists at any one moment but, above all, the capacity and competence to obtain an occupation and create it, both in the traditional and in the informal sector. Development of the capacity to obtain employment is important, owing to the devaluation suffered by education as its benefits are extended, and also to control the incidence of possible differences in social origin, with their accompanying systems of socialisation and family links.

It should be pointed out, too, that what is recommended is a generalised occupational qualification, centered on general polyvalent education. Limiting it to 'training' in 'know-how' and acquiring 'skills' implies a flagrant inequality of opportunity. The lack of a basic scientific and technological background constitutes a barrier to acceding and fulfilling oneself in activities requiring conceptual mastery over the operations of production, and the capacity to explore and create new ones. Furthermore, occupation implies capacities and competences going beyond any specific production task: they include taking one's place in increasingly complex social organizations, information about health and safety, participation in trade unions with its political ingredient, overall understanding of the world of work and the economic sector as it fits into overall development. But it is also urged that general polyvalent education should develop personal, intellectual and attitudinal characteristics, enabling the individual to cope with any structural barriers segmenting the occupational market, as displayed by the dual market theory.

The conceptual outline adopted claims to overcome traditional separatisms and lack of articulation between the various stages and forms of education. This means that it is proposed to combine, conceptually and operationally, childhood and adult education, school and out-of-school, formal non-formal and informal education, institutionalized and independent education, direct, face-to-face education with indirect or remote education, the compact, uninterruped education of the young in the school system with the broken-up, periodical education based on 'recurrent' and 'alternating' patterns more :suited to adult life, all into one broad, diverse and flexible unity.

For the implementation of continuing eco-education, it is recognized that the Education Complex will require broader boundaries.

This means that in addition to the school system, the field of education must rightly embrace out-of-school programmes and services by the mass communications media, unions, professional associations, training departments at work, cultural, scientific, and artistic bodies, youth and adult centres, and various voluntary associations. The extended Complex also includes support services such as information and documentation centres, libraries and museums, publishers and producers of teaching material, education technology research and development institutions. It is anticipated that this Complex will gradually come to be incorporated within an 'educational macro-system', which will be not only comprehensive but diversified, flexible, dynamic and open, to permit extensive use and free passage both along and across the services, formal and non-formal, operating as an 'educational self-service supermarket'.

Within this context, education is predicted to display the following characteristics: (1) 'recurrent' post-school education will be much more prolonged than school education; (2) non-formal, out-of-school education will certainly be one of the largest components within the combination of services and opportunities (3) formal and non-formal education under the control and authority of institutions will be only one of the possible forms of post-school education; a large proportion will take place independently, on the basis of self-programming and self-monitoring, making use of out-of-school agencies and of expert assistance, directly or remotely.

The educational world proposed here, the possibility of extending education as a normal activity to individuals throughout their lifetime, and to ensure maximum benefit, presupposes that the whole population possesses the necessary capacity and competence to conduct their education independently; this is one of the keys underlying assumptions.

This problem must be addressed by reconsidering current requirements for certifying completion of initial basic education or first level of training, since this is required to qualify the population along the lines mentioned. Consequently, it is proposed to replace the present standards by the level of achievement called 'point of educational self-reliance'.

The point of educational self-reliance is defined as reaching the basic threshold of independence and self-sufficiency for effective and satisfactory performance in decision-making, programming and controlling one's own education and that of the group of which one forms part, and as the threshold of qualification to participate lucidly and competently in the res publica in questions relating to education.

Thus the self- reliance standard is conceived as an education which generates and potentiates more of itself: generating the capacity to participate and create a supply of relevant educational services; and generating the capacity to conduct one's own educational process making use of the services in an autonomous, creative and effective manner.

The most important indicators of achieving this level would be the following:

(a) Possession of a constant and self-renewing motivation for learning ('growth motivated persons', Maslov).

(b) Mastery of the languages and techniques for communication, verbally and non-verbally, interpersonally, for group and social communication.

(c) Ability to deploy the tools of learning: to have 'learned to learn' for oneself, with others and as part of a group, inside and outside the school systems. It presupposes cognitive and creative capacities, together with the ability to operate with the materials and situations of learning.

(d) Possession of the basic conceptual structures and ability to handle category systems corresponding to the fundamental areas of knowledge; possession of combinatory techniques to integrate and operate with all forms of new information; possession of the capacity to perceive broad, complex situations and problems with a systematic approach, the tools and techniques with which to examine such overall, complex problems in real life in a transdisciplinary way; the ability to work out possible solutions and openings;

(e) Possession of the capacity and competence to participate in the various spheres of social endeavour, with different modes and styles of behaviour according to circumstance; capacity to take decisions, invent alternative futures and involve oneself in the task of constructing them as part of a team with one's fellows;

(f) Possession of positive attitudes towards change; this implies not only tolerance for risk, the unknown, ambiguous and unstable, but in particular, the disposition, motivation and strength to advance towards situations which may involve such features.

II. The minimum levels of education in the model

For reasons associated with the general orientation of the model, mention is only made here of the minimum levels of education regarded as indispensable to satisfy basic individual and social needs in the world postulated. The levels desired can be broken down into four categories:

(1) Basic initial education

It is considered that 98 per cent of the child population aged six and over should be reached by the school system to provide an initial basic education aimed at reaching the 'point of educational self-reliance'. It is anticipated that this standard can be reached with a schooling period of between 8 and 12 years in duration.

(2) Education of intermediate and higher level to train a critical mass of middle and higher management and to satisfy social aspirations in part

The social need that human resources be available with specific qualifications for economic, political and social activity and for autonomous and self-sustained scientific, technological and cultural development requires that a proportion of the population receive intermediate and higher education. This minimum level would also go some way to satisfying the social demand for education at such levels. Here it is felt reasonable to ensure that at least 7 per cent of the population receive intermediate education and 2 per cent receive higher education.

(3) Continuing education

The whole adult population, between the ages of approximately 20 and 50 years, should be ensured a minimum of three years of education (one tenth of a working life estimated to last 30 years), divided up into 30 modules equivalent to six weeks of full-time education per year. Making continuing education available to the adult population should provide opportunities for up-dating, going further, broadening or converting earlier training or qualification, either in response to emerging requirements in the various spheres of endeavour (work, politics, community, domestic, cultural life) or to meet personal desires and interest in broadening of experience and self-expression.

(4) Compensatory education

To attain the goal of universal initial basic education, it will be necessary to provide compensatory education services for the adult population which has not been able to achieve the minimum level established for the child population. The purpose of such compensatory education would be to ensure that educationally disadvantaged adults reach the minimum standard proposed for initial childhood education: the point of educational self-reliance.

III. Some qualitative aspects of education

To express the satisfaction of the minimum educational needs in quantitative terms would be not only a partial response to the problem, but would run counter to the basic postulates of the model. For the latter looks to a society in which mere quantitative, accumulative growth is not prized to anything like the present extent, and for education, it implies that more education for more people for a longer period of time can no longer be the sole aim. While such a development is undoubtedly required, there is also no doubt that in its qualitative aspects (type, form, content and organization), the education of today is unsatisfactory for the purposes in hand. The main points as regards educational quality, so far as concrete action is concerned, are as follows:

(1) Forward-looking orientation

If the possibility of repeating the past or prolonging the present is rejected in favour of a sustained and intensive attempt to transform reality, education will have to reduce considerably its function as guardian of history and of the safety and strength of the existing order. What is above all required is an education geared to the future it is desired to build, fitting every individual to process the future through his present behaviour.

(2) Individual and social relevance

The essential point here is that education must be firmly rooted in the specific, concrete circumstances and problems of the individual, his social sector and local, national and regional communities. It should enable particular human groupings and the individual himself to achieve enlightened awareness of the socio-economic, cultural and political situation, of the factors and mechanisms operating to reinforce this, while inculcating mastery of the necessary tools with which to act upon controllable elements of reality in the various spheres of endeavour. Relevance should be achieved by identifying and dealing with problems in their due context and manifold interconnections. This means seeing the world in its full complexity as a conjunction or constellation of problems and thus in its time dimension: its historical origin and its future projection. Clearly, these constellations need to be treated in a disciplined fashion, using the appropriate theoretical and practical tools available.

Relevance is associated with the reality and timeliness of the problems. Nevertheless, the extent of the reality and timeliness must be made clear to those who invoke them. Tackling real, up-to-the-minute problems does not mean confining enquiry to material, immediate, everyday problems associated with bare subsistence. For all those questions, material and non material, are real which contribute to the quality and dignity of life and rightfully include, inter alia, the territory of 'culture'. As traditionally understood, this relevant question has been practically reserved for the delight and creativity of the highest strata of society; for the rest, a narrow space has been left in which they could watch from afar, almost as laybrothers, as mere 'consumers' of the sacred goods.

(3) Fitting into one's own country and into the world

Despite the broadening of horizons, trends towards regional integration and international links among countries, problems associated with national identity, internal ideological and political, socio-economic and cultural issues in each country must surely continue to be the central core of education. But care must be taken to avoid allowing the appeal to nationally-based realism or pragmatism to mask conservative positions which look to traditionalism as the source of identity, a posture which usually runs counter to the effective independence and self-determination of countries, and is thus as counterproductive as the uncritical adoption of models which have proved successful in other regions or countries. But at the same time, the increasing emergence of a society of planetary dimension, increasingly interrelated, presenting problems affecting the whole world population or very wide groups of it, points to the need for a transnational curriculum of world scope, which should embrace common problem and is dictated by the force of the facts. However, the treatment and solution of the various questions involved must differ in accordance with the disparate situations and outlooks of the various regions and countries.

(4) Effectiveness for full communication

Participation presupposes capacity and special competence in communicating effectively in the various spheres and groups to which one belongs. This must be a key aim in the kind of education to be developed. The affirmation, liberation and self-determination of individuals, groups and peoples depend not only upon the full mastery of the language at its various levels and planes, but also upon mastery of the languages of number, science and technology, statistics and computers, politics, economics and the mass media. It is clearly necessary to be 'literate' in terms of the oral and written language, but to be well equipped with a broadly diversified oral facility is the central aim of the liberating training advocated. It is also necessary to be 'literate' in the symbols and coded signs of each society, and in the non-verbal languages of art, sport, gesture and overall conduct for those who are to express themselves in the many existing rôles and emerging manifestations of a diverse, mobile society.

(5) Oriented towards the achievement of a generalised quality of life

In the model proposed, the centre of gravity shifts from mere quantitative growth to qualitative expansion. Within an egalitarian conception of society, the value is emphasized of the quality of life oriented towards full human realisation, in a non-consumer society based on the use rather than the possession or accumulation of goods.

In this connection it is doubtless a cardinal point that education, as here conceived, sets first priority upon matters associated with the satisfaction of basic needs. This clearly means attaching particular importance to matters of health, physical and mental, which will help to increase life expectancy at birth. In other words, aform of education which enables the recipient to live well and for a long time. Living well, in full human fulfillment, presupposes recognizing as a basic need some measure of reflection about oneself and overall reality, creative participation in all the spheres of social endeavour; and also of enjoyment of life, situations and goods. Here the development of reflective thought and historical and critical awareness are necessary but not sufficient objectives; for to achieve a fuller life, both individual and social, the non-cognitive and corporal domains must be recognized and cultivated. This make its necessary to revise the concept of education to recover nature and the natural life, displace work from its central place in the scheme of values, and assign an increasingly high place to expressive endeavour, physical and manual, voluntary social activity, leisure, recreation and games. In other words, it is necessary to educate people to live a full, dignified, expansive, open, spontaneous, liberated life in a society with the same features and lastly to develop the skills and attitudes to take action, to be protagonists and 'make' history.

(6) Firmly committed to advance from education for dependence towards a liberating education based on self-reliance.

In the society advocated, positive value is attached to a form of education designed to liberate individuals and peoples. In other words, what it does is directed to forming individuals and social groups with a clear awareness of themselves and their situation, who are lucid, critical and vigilant, desirous of truth and self-determination, resolved, upon and capable of commitment to the construction of an individual and collective reality which is satisfactory to the majority. This will entail overcoming the structural forms and the 'modus operandi', especially of the school systems, the core of the education system, which operates as a mechanism for preserving the established order, exercising authority in a variety of ways to obtain adaptive, respectful, dependent behaviour patterns. Three questions thus appear central with regard to the 'modus operandi',

(i) The forms of socialization. It is felt necessary to overcome authoritarian imposition of standards and rigid behaviour patterns, with their accompanying premium upon respect and subordination, and to introduce opportunities and mechanisms for participation in their formulation.

(ii) Curricula must be flexible, open, module-based, and without frontiers, in direct contrast to their present features of rigidity, prescription, consolidation and compartmentalisation. Some points should be made however about curriculum content. Recognizing the importance of a solid grounding in science and technology, it is worth putting particular stress on the social sciences since these, together with the teaching of language and the communications techniques, constitute the critical nucleus of the curricula in the society advocated, and particularly in making the transition to that future. There are very few cases today of generalized treatment of social reality as it is now, and in its perspectives using the conceptual and methodological tools of the empirical sciences. While this is of concern to all countries it is a particular issue for the developing countries, as it can foster understanding of the truths characterizing social problems, especially the 'history' and 'geography' of inequality, hunger, disease, poverty, ignorance, low rate of participation in the exercise of power, etc. Conjuring concrete social reality right out of curricula is a powerful weapon for domination.

(iii) The educational technology considered advisable is not geared, as it has been up to now, to teaching but to learning, self-learning and learning with others. First and foremost, because this is the mechanism of self-reliance, and also because in the broad process of post-school education, education must come about to a great extent independently, without any teacher or instructor as such. Here the rôle of the educator changes to that of expert guide and promoter, whose central function is to help people obtain and process the information they need to organize or reorganize their own behaviour.

EDUCATIONAL DEPENDENCY AND THE NEW INTERNATIONAL CULTURAL ORDER: THE AFRICAN UNIVERSITY AS A CASE STUDY

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African universities have often been expected to serve as major instruments of development in their societies. But what if those universities also constitute links in a chain of dependency?

As instruments of potential development the universities have been called upon to produce high level manpower, "relevant" research and training, "appropriate" skills, and potential innovators. Many universities have failed to live up to those developmental ideals, but development has continued to be regarded as a relevant basis for evaluating the performance of any African institution of higher learning.

But let us again ask the basic question: What if the institution is also a link in a chain of dependency? Is it possible that the developmental lapses and deficiencies are connected with the constraints of dependency? And how can the dependency be transcended?

Some aspects of academic dependency in Africa are clear and unmistakable . In structure virtually all universities in Africa south of the Sahara, are based on one or more western models. , Virtually all these African universities use a western language as the primary medium of instruction. Many rely overwhelmingly on books and articles published by westerners or in the West to fill the shelves of their modest libraries. Some continue to have large numbers of Western instructors and professors on their faculty. Qualifications for student admission and staff recruitment continue to put a high premium or prior assimilation into western culture among the candidates. Among the most prestigious of African universities are precisely those which were at one time, or continue to be overseas extensions of some university in Europe. Among them are the universities of Ibadan, Ghana at Legon, Dakar and the Old Makerere in Uganda.

Because our concern is partly with the search for a new international cultural order in this essay, we shall go beyond examining the intrinsic academic dependency of the African university in itself. We shall also explore the wider effect of that dependency on the society as a whole. An institution can itself be dependent without necessarily spreading dependency over the wider society. But the university in Africa is not only sick itself - it is also a source of wider infection and societal contagion. That is why this paper is about cultural dependency, and not merely about academic dependency within the university structure on its own.

We should thus begin with what we mean by culture and then advance some working definition of our sense of dependency.

I. The seven functions of culture

For our purposes in this essay culture serves seven fundamental functions in society. First, it helps to provide lenses of perception and cognition. How people view the world is greatly conditioned by one or more cultural paradigms to which they have been exposed. A graduate from an African university thus views the world around him in a manner qualitatively differently from how he would have viewed it had he never gone to western or neo-western educational institutions.

The second function of culture lies in providing motives for human behavior. What makes a person behaviorally respond in a particular manner is partly cultural in origin. As a member of an audience in the theatre in Accra should I laugh when King Lear goes mad? Ghanaian undergraduates have been known to laugh at Shakespearean tragedy on the stage. Is this partly because they are caught up in a cultural ambivalance of some kind? What about the students' motive for being at the university at all? Is that also a product of culture change in Ghana?

The third function of culture lies in providing criteria of evaluation. What is deemed better or worse, ugly or beautiful, moral or immoral, attractive or repulsive, is partly a child of culture. The evaluative function of culture need not always correspond with the behavioral. Many African university graduates would condemn ethnic nepotism or "tribalism" as immoral. This is an evaluative position derived partly from Western influence. But the same graduates may find themselves practising ethnic nepotism inspite of their new values. This would be a case of behavioral dissonance.

The fourth function of culture provides a basis of identification. Ethnic nepotism is itself a product of culture in this identity sense. Western culture as transmitted in African educational institutions provides rival forms of identification - some of them related to the emergence of new elites and new social classes.

Fifthly, culture is a mode of communication. The most elaborate system of communication is language itself. In East Africa in the first two decades of colonial rule, there was considerable debate about language policy. Should the ethnic languages be given priority in the new imperial system? Or should Kiswahili be promoted as a lingua franca? Or did the cultural logic of European imperialism imply the promotion of European culture and languages first and foremost?

At the level of higher education when the time came there was little debate. The relevant medium of higher education was the imperial language itself. This decision, as we shall indicate later, had fundamental consequences in matters which range from intellectual imitation to elite-formation.

The sixth function of culture lies precisely in providing a basis of stratification. Class, rank and status are profoundly conditioned by cultural variable. University education in Africa became a major factor in redefining status and gradation in modern African societies.

The seventh function of culture lies in the system of production and consumption. In our scheme of analysis - unlike in some Marxist schools - patterns of consumption sometimes affect production as profoundly as production helps to shape consumption. Universities in Africa have played a part in distorting consumption patterns as well as in influencing productive trends.

These seven functions of culture have relevance for the new international cultural order. What lies in the way is the whole problem of dependency. Let us now turn to this.

II. Types of dependency

At least in the content of our analysis in this essay, dependency involves at least one of two forms of relationship. One is a relationship of surplus need. Society B is dependent on Society A if B needs A more than A needs B.

The second type of dependency involves deficit control. B is dependent on A if B has less control over their relationship than A has. In a colonial relationship proper A is the imperial power and B is each colony. After independence A's control may decline in some spheres.

But which spheres? For analytical purposes we may distinguish between the political sphere, the military sphere and the cultural.

In terms of surplus need before B became annexed as a colony, it was A that "needed" B economically. Colonies were perceived by A as potential sources of raw materials, or potential markets, or source of labour or recipients of surplus population from A. Technically therefore, England was a dependency of its own Empire in this special sense of England's economic needs, real or imagined.

But in terms of deficit economic control, it was the colonies that were dancing to England's economic commands instead of the other way round.

The factors which made the difference in control at that time were political and military. By definition the colonies were political dependencies of Great Britain, and subject to its monopoly of physical force over their territory.

But while the British and the French were covetous of Africa's economic resources, they had little interest in Africa's cultural resources. Indeed, the French doctrine of assimilation was even prepared to exchange French culture for African economic riches.

This introduces a fundamental difference between economic dependency and cultural dependency. While economic dependency has always included some leverage on the part of the "colony" upon the metropole (since the centre needs the periphery economically),cultural dependency has been much more of a case of one-way traffic at the organized level. The imperial power was prepared to dump its cultural goods on the African market, but it was not interested in purposefully importing African culture back into Europe. Whatever African culture has penetrated Europe has been due far less to organized European policies than to the activities of individual scholars, artists and antiquarians,and to the cultural impact of African slaves imported into the western world.

Europe on the whole was prepared to offer its religion, languages and culture to Africans - but only in exchange for land, mines, labor, energy and other economic riches of Africa. Jomo Kenyatta in the old colonial Kenya was more profound that even he may have realized when he observed:

> "When the white man came to Africa he had the Bible and we had the land. And now? We have the Bible and he has the land".

It was a classic case of offering culture in exchange for material goods - exporting art and ideas and importing economic riches.

By the time African universities were established Africans themselves were all too eager to scramble for western culture. On the basis of surplus need, there was no doubt at all that Africans felt a need for western culture far greater than the West felt it needed African culture. On the basis of deficit control, western institutions exerted disproportionate control over African institutions. Culture dependency was becoming much more acute, and less reciprocal, than economic dependency.

III. The impact of World War II

This brings us to the strange and paradoxical rôle of World War II in the history of the different forms of dependency in Africa. Politically, the war weakened imperial control and prepared the way for the disintegration of the empires of France and Great Britain. But economically the war helped to integrate the colonies more firmly into the global capitalist system as the economies of the periphery were made to serve more systematically the war needs of the centre. As for the cultural impact of the war, it broadened Africa's exposure to alien influences, and later resulted in the new imperialism of building higher educational institutions for the colonies. Militarily, the war initiated more firmly the idea of recruiting African soldiers and setting-up African armies equipped with modern weapons - with all the consequences that process has had for both military dependency and the tensions of civil-military relations in the former colonies.

Our focus in this particular section is on the impact of World War II on cultural dependency. But that requires some understanding of the other effects of the war.

Politically, imperial control was being weakened partly because of the weakening of the imperial powers themselves. France had been humiliated and partly occupied by the Germans - putting a strain on the old mystique of imperial invincibility and the grandeur of France which had been propagandized in the colonies. Great Britain was getting exhausted and impoverished as the war dragged on. British India was restive, though loyal - while the Japanese played havoc with Burma and the Malayan peninsula. The British Empire in Asia was not going to last long after the was not going to last long after the war, even if Britain won.

African nationalists like Awolowo, Nkrumah, Kenyatta and Azikiwe, were watching these developments in the old empires with rising hopes and aspirations for Africa's own liberation. Even for those Africans who had not been abroad the war was helping to broaden their international horizons in the very effort to follow the fortunes of the different battles on the radio and in "vernacular" newspapers. Never before had so many ordinary Africans tried so hard to understand conflicts in such remote places as Dunkirk and Rangoon, Pearl Harbor and even El Alamein.

In addition there were the African servicemen themselves who experienced combat thousands of miles from their villages, who learnt new skills and acquired new aspirations, and who witnessed the white man in a new light, both as an enemy on the other side and sometimes as a frightened comrade in the trenches.

But while the war was thus undermining the political control of the old empires, it was also increasing temporarily Europe's need for the products of the colonies. There was rationing throughout the empires - and a continuing effort to make the colonies produce what Europe most needed. New food products were cultivated with Europe's hungry mouths in mind, new raw materials were produced in the periphery with Europe's industries as the intended market. There was a war boom in the colonies, to be followed later by a new depression. The very dialectic between this kind of boom and depression in Africa was a symptom of Africa's new level of economic integration into the international capitalist system. The same war which was weakening Britain's and France's political control over their colonies was at the same time deepening Africa's economic dependency upon the western world as a whole.

What about the cultural impact of the war on Africa? This was partly related to the other processes we have mentioned. As more and more people in Britain realized that the colonies could not be held in subjection forever, and a new timetable was needed for imperial policy, a new commitment to "colonial development and welfare" emerged. It was no longer enough merely to maintain law and order in the colonies and let social change take its own slow course. A new sense of developmental urgency began to influence policy-makers at the colonial office in London.

It was partly out of this developmental urgency that the idea of accelerating higher education for the colonies was elaborated further. In 1945 the Asquith Report was submitted to the British Government. It was a blueprint for higher education in the colonies. One of its basic assumptions was that the colonies needed the kind of indigenous leadership which had acquired western skills and a "modern" outlook. The stage was being set for new forms of cultural penetration into the colonies.

But it should be emphasized at once that the motives were often of the highest. It was true that Africa had been left behind in certain basic skills of the "modern" technological era. Unfortunately the universities which were emerging were not primarily designed to help Africa close the technological gap between itself and those who were more advanced. On the contrary, the new colonial universities imported the same contempt for practical subjects that had characterized the academic ethos of the West for centuries. But while the West had evolved safeguards against this academic arrogance, and produced other ways of fostering technology and engineering, the colonies imported the academic arrogance without its safeguards.

The contradiction was not always recognized either by Britain or by new spokesmen of African aspirations in the colonies. It was an often stated British imperial policy to offer Africans the education best suited to African conditions and needs. Educators such as Carey Francis in East Africa were most anxious not to de-Africanize African youth through western education. But as a result of the educators on the ground not being sufficiently innovative, they ended up doing what they probably knew best - duplicating what was offered in Europe. Bishop Masasi's more distinctive experiments in Southern Tanganyika stood out among the rare innovations .

In some cases the new post-war policy of "universities for the colonies" partially diluted an earlier imperial commitment to vocational and practical training. In its pre-university incarnation Makerere in Uganda was noted less for its liberal arts than for professional training in "MAVE" (Medicine, Agriculture, Veterinary Science and Education). While these subjects continued to be a major concern of Makerere after it attained university status, (Veterinary Science was later transferred to University College, Nairobi) the proportion of students taking them drastically declined. The appeal of the liberal arts deprived the Faculty of Education especially of its fair share of the brighgest students for many years to come. In Makerere's pre-university days Education as a professional faculty had a significantly higher proportion of the most gifted student than it later did. The most illustrious of this earlier batch of Makerer's trained teachers turned out to be Mwalimu Julius Nyerere, destined to become the philosopher-president of Tanzania several years later.

What all this means is that the new welfare colonialism which ensued upon a new impetus to liberal arts and literary education, sometimes at the expense of earlier progress in more practically-oriented educational policies.

In this connection it is worth bearing in mind important differences between the westernization of Africa and the modernization of Japan after the Meiji Restoration of 1868. Japan's original modernization involved considerable selectivity on the part of the Japanese themselves. The whole purpose of selective Japanese westernization was to protect Japan against the West, rather than merely to submit to western cultural attractions. The emphasis in Japan was therefore on the technical and technological techniques of the West, rather than on literary and verbal culture. The Japanese slogan of "western technique, Japanese spirti" at the time captured this ambition to borrow technology from the West while deliberately protecting a substantial part of Japanese culture. In a sense, Japan's technological westernization was designed to reduce the danger of other forms of cultural dependency.

The nature of westernization in Africa has been very different. Far from emphasizing western productive technology and containing western life-styles and verbal culture, Africa has reversed the Japanese order of emphasis. Among the factors which have facilitated this reversal has been the rôle of the African university.

In order to understand this rôle more fully, let us examine it in relation to those seven functions of culture that we defined earlier, though not necessarily in the order in which those functions were originally enumerated.

IV. The African university and dependent paradigms

As we indicated, one primary function of culture is to provide a universe of perception and cognition; a societal paradigm, a world view. Kuhn's work on the structure of scientific revolutions has provided new insights into the process through which scientific paradigms shift, and how new alternative systems of explaining phenomena come to dominate scientific thought.

But what about shifts in cultural paradigms? And how are these related to shifts in scientific ones?

Religion is often a cultural paradigm in its own right. Copernicus and Galileo between them, by helping to transform scientific thought on planetary movements, in time also helped to change the Christian paradigm of the universe.

Charles Darwin, by helping to initiate a revolution in the biological sciences, also started the process of transforming the Christian concept of "creation". These are cases in which paradigmatic changes in the sciences have led to pardigmatic changes in religion. Historically there have also been cases where religious revolutions have resulted in scientific shifts. The rise of Islam gave the Arabs for a while scientific leadership in the northern hemisphere. Puritanism and non-conformity in Britain in the eighteenth century was part of the background to both a scientific and an industrial revolution in that country.

But paradigmatic changes are caused not merely by great minds like those of Copernicus, Newton, Darwin and Einstein, nor only by great social movements like Islam and the Protestant revolution, but also by acculturation and normative diffusion.

It is in this sense that colonialism constituted a major shift in the cultural paradigm of one African Society after another. Traditional ideas about how rain is caused, how crops grow, how diseases are cured, and how babies are conceived, have had to be re-examined in the face of the new scientific culture of the West.

If African universities had borrowed a leaf from the Japanese book, and initially concentrated on what is indisputably the West's real area of leadership and marginal advantage (science and technology), the resultant African dependency might have been of a different kind. But the initial problem lay precisely in the model of the university itself - the paradigm of academia, with its distrust of direct problem-solving in the wider society. "There is much in our education system (in Britain) which makes it easier to define problems in terms of narrowly scientific objectives. The existing relationship between universities (with the unidirectional flow of 'experts' and advisors, the flow of overseas students to this country, etc. have tended to transfer the same standards and expectations to the LDCs.... Technologies for the satisfaction of basic needs and for rural development, have received little attention.... curricula, textbooks and teaching methods are too closely imitative of practice in industrialized countries. This has spilled over from teaching into research expectations. Universities have aimed to achieve international standards in defining the criteria for staff recognition and promotion; in practice this means using the international scientific engineering literature as the touchstone. However, applied work directed at the solution of local problems.... can rarely be associated by publication in 'respectable' journals: a far better test is the local one of success or failure of the particular project in the LDC environment"[1].

The one paradigmatic change which was necessary for the imported universities did not in fact occur. The missing factor was a change in the conception of the university itself and what its purposes were.

But the "lack of change" in the conception of the transplanted university caused a lot of changes in the attitudes, values and world view of its products. Since the university was so uncompromisingly foreign in an African context, and was transplanted with few concessions to African cultures, its impact was more culturally alienating than it need have been. A whole generation of African graduates grew up despising their own ancestry, and scrambling to imitate others. It was not the traditional African that resembled the ape; it was more the westernized one, fascinated by the West's cultural mirror. A disproportionate number of these cultural "apes" were, and continue to be, products of universities.

Those African graduates who have later become university teachers themselves have on the whole remained intellectual imitators and disciples of the West. African historians have begun to innovate methodologically as they have grappled with oral traditions, but most of the other disciplines are still condemned to paradigmatic dependency.

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1. Pyle, L. "Engineering in the universities and development", paper presented at the Conference on "The future relationships between universities in Britain and developing countries", held at the Institute of Development Studies, University of Sussex, England, March 17-20, 1978, pp. 2-3.

This includes those African scholars that have recently discovered Karl Marx. The genius of Marx did indeed initiate a major international paradigmatic shift in social analysis. But Marx's theories were basically Eurocentric, and his legacy constitutes the radical stream of the western heritage. Those African scholars that have replaced a western liberal paradigm with a western radical paradigm, may have experienced a palace coup in their own minds or a changing of the guards within the brain. But they have not yet experienced an intellectual revolution in this paradigmatic sense. The ghost of intellectual dependency continues to haunt the whole gamut of Africa's academia for the time being.

V. The African university and borrowed languages

An important source of this intellectual dependency is the language in which African graduates and scholars are taught. For the time being it is impossible for an African to be even moderately familiar with the works of Marx without the help of a European language. Das Kapital is not yet available in Hausa or Swahili, let alone in Kidigo or Lutoro. Parts of the Manifesto of the Communist Party have already been translated into Swahili and Amhara, but it may take the rest of this century before even a quarter of the literary output of Marx and Engels is available in one single African language unless there is a genuine educational revolution involving widespread adoption of African languages as media of instruction.

As matters now stand, an African who has a good command of a European language has probably assimilated other aspects of western culture as well. This is because the process of acquiring a European language in Africa has tended to be overwhelmingly through a formal system of western-style education. It is because of this, that the concept of an African Marxist who is not also westernized is, for the time being, a socio-linguistic impossibility.

This need not apply to a Chinese or Japanese Marxist, where it is possible to undergo an ideological conversion at a sophisticated level without the explicit mediation of a foreign language. Japan especially, has tamed its language to cope with a wide range of intellectual discourse.

Of course the Japanese range goes beyond ideological and political literature. But in black Africa for the time being, a modern surgeon who does not speak a European language is virtually a socio-linguistic impossibility. So is a modern physicist, zoologist and economist.

Nor is this simply a case of the surgeon, or physicist or economist acquiring an additional skill called a "European language" which he is capable of discarding when he discusses surgery or physics with fellow professionals in his own society. Professional Japanese scientists or social scientists can organize a conference or convention and discuss professional matters almost entirely in Japanese. But a conference of African scientists, devoted to scientific matters, and conducted primarily in an African language, is for the time being sociologically impossible.

Almost all black African intellectuals conduct their most sophisticated conversations in European languages. Their most complicated thinking has also to be done in some European language or another. It is because of this that intellectual and scientific dependency in Africa is inseparable from linguistic dependency.

And since a major function of culture lies, as we indicated, in providing media of communication,the choice of European languages as media of instruction in African universities has had profound cultural consequences for the societies which are served by those universities.

It is possible that outside Arab Africa and parts of Eastern Africa, the imperial founders of African universities had no choice. The great majority of African languages did not have enough speakers to justify the massive financial and intellectual investment necessary for making them effective media of higher education. But even those African languages like Swahili which stood a chance of developing in that direction did not receive adequate imperial support. As for Arabic in the Sudan, there continues to be discordance between the English language as a medium at Khartoum University and the Arabic-orientation of pre-university education, with severe cuts in quality for all levels of instruction.

What should be remembered is that by the time these African universities were being established, African intellectuals had already become so mentally dependent that they themselves insisted on considerable imitation of western educational systems - including the importation of western media of instruction for African use. Dependency is cumulative; cultural dependency is particularly prone to this tendency.

VI. The African university and derivatives stratification

Concurrently with these other cultural changes came changes in stratification. What is a social class? Some have defined it in terms of "who owns what"? But in the new Africa a social class was beginning to bet defined in terms of "who knows what"? Familarity with certain aspects of western culture began to be particularly crucial among the new forces of elite-formation.

In most African countries independence meant the transfer of power from the West to the westernized. The new politicians were those with a good command of the imperial language and a substantial initiation into the western life-style. In the earlier days of colonial rule there had been a debate about which African the imperial system should support - the "native in a blanket" or the "native in trousers". Many colonial policy-makers had distrusted western education and strove hard to protect the "native in a blanket". Lord Lugard, perhaps the greatest of British colonial administrators in Africa, was particularly concerned about the disruptive consequences of western civilization in African societies. His philosophy of Indirect Rule as a system of governing African societies through their own institutions was partly designed to contain and regulate, and sometimes even prevent, the process of westernization in places like Northern Nigeria.

But in much of Africa though not necessarily in Northern Nigeria), power was finally transferred to "the native in trousers". The westernized and semi-westernized Africans that had once been dismissed as "arrogant upstarts" began to be taken seriously as heirs-apparent to the imperial system. The founding fathers of the new independent African states were disproportionately of this category. They included such figures as Nnamdi Azikiwe of Nigeria. Kwame Nkrumah and Kofk Busia of Ghana, Jomo Kenyatta and Tom Mboya of Kenya, Felix Houphouet-Boigny of the Ivory Coast, Leopold Senghor of Senegal, and Julius K. Nyerere of Tanzania.

The initial constitutional arrangements in most African states seemed designed to maintain power among the acculturated. On the whole no African could become a member of parliament unless he had a command of the relevant European language. An African who spoke seven of the indigenous languages of, say, Nigeria, but could not speak English, was *ipso facto* disqualified from representing his people in the federal parliament. On the other hand, a Nigerian politician might hypothetically speak only English, and be incapable of using any indigenous Nigerian language, and yet still be constitutionally eligible to sit in the federal parliament.

Most of this was also true in the majority of other countries south of the Sahara. To represent an African constituency required competence in a European language. And because one could not be a member of an African parliament without a European language, one could not be a Minister in an African government either. And because one could not be an African Minister without such European credentials, one could not ascend to the very pinnacle of power - the presidency - without those credentials either. In other words, access to the commanding heights of African political systems was partly predicated on the prior westernization of the candidates for office.

African universities played a leading rôle in fostering this new basis of stratification. They helped to give western culture as a whole greater legitimacy in African societies. They produced teachers for lower levels of education and thus helped to continue the Eurocentric tradition of the colonial educational system. The universities also produced opinion-leaders in other public pursuits. The university degree itself was for a while a major passport to influence and opportunity. The class-systems of African societies were in a state of flux - and culture dependency was part of this problem of restratification.

In fairness to some African governments and educational reformers, we must recognize some of the agonized efforts that have been made to modify the colonial heritage. In Kenya alone, at least three major educational commissions (Ominde 1964, Ndgwa 1971 and Gachathi 1978) have dealt with educational reform - not to mention numerous workshops and seminars.

But reforms in Kenya have been rather slow in coming. Some important concessions have been made to Swahili. It enjoys more attention at the University of Nairobi and Kenyatta University College than it has ever done before, but the attention is still modest by absolute standaros. The status of Swahili at lower levels of Keyian's educational system is also modest in spite of the elevation of the language into the "national language" of Kenya with English as the "official language". English continues to overshadow Swahili decisively at least from the third year of schooling onwards.

In terms of political stratification, an important step was taken when Swahili was adopted as the language of Kenya's parliament from 1974 onwards. But significant anomalies remain. Whereas legislation in Kenya's parliament is still presented in English, the debate on that legislation is now conducted in Swahili. The speech on the budget continues to be made in English with full political and diplomatic ceremony. The minimum qualifications required of a parliamentary candidate continue to include competence in the English language - but not necessarily competence in Swahili. The most important language of national politics is now Swahili - but the official language of the Kenya constitution continues to be English.

Because of these continuing anomalies, the political establishment of the country continues to consist disproportionately of those who have been initiated into the culture of the former imperial system. The University of Nairobi is central to the structure which is perpetuating the Britannic factor in Kenya's system of political stratification.

What is true of Kenya is basically true of most of former colonial Africa south of the Sahara. Indeed, these countries which do not have the equivalent of Swahili as a lingua franca are condemned to even more severe cultural dependency than Kenya, with all the consequences of derivative elite-formation.

VII. Identity, values, motives and economic culture

We have so far examined the African university in relation to three of the functions of culture - perception, communication and stratification. The remaining four functions are culture as identification, as criteria of evaluation, as motives of behaviour and as a system of production and consumption.

These functions need more space than is available in a single paper. For the time being let us merely introduce them in relation to the influence of western education and its tertiary extensions within Africa.

Stratification is basically a ranking of social groups. But each group has an identity of its own and the interaction between these groups has its rules . Perhaps the most elaborate of the rules of stratified identities occur in caste-societies. On balance the impact of western education on such caste systems has been progressive - since it has created doubts about the legitimacy of caste as a mode of categorizing people. This has certainly been true of India, though the problem is still acute. It is also true of those few African societies that have something approximating caste. Chinua Achebe captures these dilemmas in his second novel, No longer at ease.

Obi's education in the West creates doubts in his mind about the legitimacy of the status of Osu (Ibo's equivalent of the Harijan or untouchable caste). And yet tradition is too strong, and Obi himself is too weak to resolve the issue in a manner compatible with his affection for Clara, the Osu girlfriend. The old rules of interaction castes are still compelling, but doubts have been created by western education - and the Ibo mind is "no longer at ease" on this issue.

Also strained partly as a result of the western impact are the residual caste relations between the Hutu and the Tutsi in Burundi. Things have indeed been "falling apart" since the old traditional rules of authority and deference in Ruanda-Urundi were eroded by the challenge of a new normative order from the West. The clashes of identity between the Hutu and the Tutsi are reflected in other ethnic tensions elsewhere in Africa.

Rules of interaction between the sexes in Africa have also been in the process of modification as a result of western education. Specially striking is the status of African women with university degrees. Women's liberation in Africa, as in most other parts of the world, is at best an aspiration rather than an accomplished fact. But among the factors which are facilitating it is the emergence of women graduates from African universities, asserting a greater independence than they might have done had they not received higher education in the western idiom. In this instance the cultural dependency which has come with the western impact on Africa is having the paradoxical side-effect of facilitating greater independence for African women.

A third area of identification which has been affected by higher education in the western idiom concerns relations between age groups in African societies - including these societies which have age-grades. Western education has eroded deference for elders, and made difficult to maintain solidarity between age peers if some are westernized and others not.

The fourth and most comprehensive area of rules of interaction in relation to salient identification goes deep into political ideology. Universities in Africa are producing both defenders of western liberalism and civil liberties and critics of such liberal rules. Is the individual the proper and ultimate unit of identity? The universities are also producing both the egalitarian radicals of the new Left in Africa and their ideological adversaries. Is social class the proper and ultimate unit or identity?

The rules of the game in Africa are still in a state of flux, partly because of considerable cultural fluidity in this period of transition. African universities are major contributors to that cultural fluidity.

Culture as a set of rules is in fact inseparable from culture as a set of standards. This is where criteria of evaluation come into being. Western education has helped to change taste, morals, and other values. Western criteria of good and bad, ugly and beautiful, have won many African converts. In the words of the late Oxford political philosopher, John Plamenatz: "The vices of the strong acquire some of the prestige of strength". (Plamenatz, on Alien Rule and Self-Government).

In other words, even the evil side of the western demonstration effect has had a considerable impact on Africa. Some might even say that Africa has in reality been readier to imitate the evil side of the western example than the good side!

Be that as it may, there is little doubt that African concepts of what is proper or improper, just or injust, attractive or repulsive, have now been profoundly influenced by that system of education of which the University is the pinnacle. As Loweno has lamented about her Westernized Acholi husband:

> You trembled [once upon a time]
> when you saw the tattoos
> on my breasts
> And the tattoos below my belly button;
> And you were very fond
> Of the gap in my teeth ...
> My husband [now] says
> He no longer wants a woman
> With a gap in her teeth.
> He is in love
> With a woman
> Whose teeth fill her mouth completely
> Like the teeth of war-captives and slaves[1].

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1. Bitek, Okot p', Song of Lawino. (Nairobi: East African Literature Bureau, 1966) part 4.

For better or for worse Acholi concepts of beauty and adornment in Uganda are gradually giving way to western criteria. It is symptomatic of a deep normative change that Africa is experiencing - sometimes smoothly, sometimes convulsively. Western education is only part of the agony of transition. But it is a major factor in this tumult of change.

Values in turn affect another aspect of culture - motives for behavior and conduct. The pursuit of private advantage, which in some parts of Africa has been aggravated by the impact of Western individualism and the erosion of traditional restraints, has sometimes led to a reckless ethos of "get rich quick" and an escalation of corruption and greed. Part of the cultural change is due to an interaction between the money economy (which is new in many parts of Africa) and Western notions of individualism and private profit. African universities cannot be blamed for these reckless acquisitive excesses in contemporary African Society. The universities are simply caught up in the contradictions between old rules and new motives, old impulses and new norms.

Sometimes even genuinely constructive changes like a greater concern for the value of time and the need for punctuality can erode older motives for courteous behaviour and social responsibility. Again Loweno is eloquent on this issue:

> Time has become
> My husband's master
> It is my husband's husband.
> Like a small boy,
> He rushes without dignity.
> And when visitors have arrived
> My husband's face darkens,
> He never asks you in,
> And for greeting
> He says
> "What can I do for you"....
> Listen
> My husband
> In the wisdom of the Acoli
> Time is not stupidly split up
> Into seconds and minutes ....
> It does not get finished
> Like vegetables in the dish
> A lazy youth is rebuked,
> A lazy girl is slapped,
> A lazy wife is beaten.
> A lazy man is laughed at
> Not because they waste time
> But because they only destroy
> And do not produce[1].

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1. *Ibid*, part 7.

As for culture as this system of production and consumption, African universities have played a part in producing high-level personnel for important areas of African economies. But on balance the universities have contributed more to African bureaucracies than directly to the productive processes of African economies. The bureaucratic bourgeoisie which wields considerable political power in most African countries, is on the whole a product of Western education. The impact of this class of people on patterns of consumption in African countries is sometimes greater than their impact on levels of production. But the centrality of their position in Africanpolitical systems has in many cases made them custodians of the highest levels of economic policy in their countries - for better or for worse.

CONCLUSION

We have sought to demonstrate in this paper that the African university is part of a chain of dependency that continues to tie Africa to the Western world. African perceptions, models of communication, structures of stratification, rules of interaction, standards of evaluation, motives of behaviour and patterns of production and consumption have all been undergoing the agonies of change partly under the disturbing impact of Western culture.

African universities have been the highest transmitters of Western culture in African Societies. The high priests of Western civilization on the continent are virtually all products of those cultural seminars called "Universities".

On balance the African university is caught up in the tension between its ambition to promote genuine development in Africa and its continuing rôle in the consolidation of cultural dependency. If genuine development has to include cultural decolonization, a basic contradiction persists in the ultimate functions of an African university. It may generate skills relevant for modernization and development. But it has not even begun to acquire, let alone to transmit to others, what is perhaps the most fundamental skill of them all - how to promote development in a post-colonial state without consolidating the structures of dependency inherited from its imperial past.

Towards decolonizing the African university

Development: The strategy of domestication

If development for Africa means the decolonization of modernity, then three major strategies are needed for African development - two of them capable of rapid implementation, and the third for slower but sustained introduction. The first strategy concerns the domestication of modernity: the bid to relate it more firmly to local cultural and economic needs. The second strategy is paradoxical. It involves the wider diversification of the cultural content of modernity. Under this approach the foreign reference-group for an African institution becomes not only the West, but also other non-African civilizations. The African university is thus to be transformed from a multinational to a multicultural corporation. The third strategy is perhaps the most ambitious. It concerns an attempt by the African continent as a whole, to counter-penetrate western civilization itself. Let us take each of these strategies, beginning with the imperative of domestication in relation to education.

Until now there has been no doubt that African educational systems have entered deeply into the life styles of local societies, for better or for worse. In the very process of producing educated manpower, creating new forms of stratification, accelerating Westernization and modernization, African educational institutions have been major instruments through which the Western world has affected and changed the continent.

In order to shift this balance, African societies must be allowed fundamentally to influence the educational systems themselves. It is not enough for an African university to send a travelling theatre to perform a play by Shakespeare or even by the Nigerian playwright, Wole Soyinka, before rural audiences in different villages. This type of endeavour is indeed required, and helps to deepen the life experiences of folk communities in the villages. But the travelling theatre of a university like Makerere is one more form of academic impact on the wider society. It does not by itself constitute a reverse flow of influence.

(This is an extract from Mazrui, "The African university as a multinational corporation: Problems of penetration and dependency", Occasional paper, Institute of development studies, University of Sussex, England, 1975. A version of the paper has also been published in Harvard Educational Review, Vol. 45, No. 2, May 1975, pp. 191-210).

Similarly, extra-mural departments and even extension services are valuable methods of increasing skills and expanding social awareness among rural communities. Like a number of other professors at Makerere University in Uganda, I travelled many miles on hard roads to address village schools and assemblies on the implications of public policies in Uganda and the nature of the political system of the country. That kind of commitment was a way of reaching out to the isolated groups of the African countryside. But once again it was much less an exercise in being affected by the society than an exercise in reaching the society. The social impact was still one-sided.

The first task, then, in decolonizing modernity is to enable the influence of the local society to balance that of the Western reference group. But how is this process to be realized in the universities? Four major areas have to be examined afresh: the requirements for admission of students, the content of courses throughout the educational system, the criteria for recruitment of teachers and other staff, and the general structure of the educational system.

University admission requirements should be reformed in the direction of giving new weight to certain subjects of indigenous relevance. Social and cultural anthropology ought to become a secondary school subject, rigorously examinable, and required for entry to university. This should help promote considerably more interest in African cultures in primary and secondary school. Secondly, admission to a university should include a requirement for a pass in an African language. There were times when many African universities required some competence in Latin for entry into some faculties; the African university of the future should require competence, formally demonstrated in an examination, of at least one African language regardless of the subject that the student proposes to study once admitted

African dance and music should be given a new legitimacy in all primary and secondary schools, regardless of the sensitivities of the missionary authorities in power. Investigation should be undertaken into whether dance and music should be competitive, and in what way the ethnic diversity of musicological experience can be made creative rather than disruptive in an African school. These problems are far from insurmountable, and could add a new richness to African aesthetic experience alongside the imported recreations of sports and athletics.

Progress has already been made in the teaching of African history and literature. Further progress can be made, including more effective utilization of oral literature, duly transcribed, as an introduction to the pre-literary aesthetic creativity of African societies. The university in turn should re-examin examine the content of its courses, permitting indigenous culture to penetrate more into the university, and non-Western alien contributions to find a hearing at African universities. Recruitment of faculty will in turn be affected by these considerations. Must all teachers at an African university have formal degrees from Western or Western-type educational institutions? Or should there be areas of expertise where lecturers or even professors could be appointed without the degree requirement so characteristics of Western institutions? Okot p'Bitek has compared the recruitment requirements for a university with the electoral requirements for an African parliament. African parliaments have on the whole insisted on competence in either English or French before an African could become a member. A candidate could speak ten African languages, and still be ineligible for parliament if he did not speak the imported metropolitan language. Conversely, a candidate could speak only English or French, and no African language, not even the language of his immediate constituents, and still be eligible for parliament. Okot p'Bitek saw the linguistic and formal requirements of university appointments in terms similar to the formal requirements for a parliamentary career in Africa: "You cannot become a member of their parliament unless you can speak English or French... You may be the greatest oral historian but they will never allow you anywhere near their university... Our universities and schools are nests in which black exploiters are hatched and bred, at the expense of the taxpayers, or perhaps heartpayers".[1]

The question which arises is whether there are specialists of oral history in African societies who can be appointed to university faculties without having a formal degree. Presumably this might be difficult if these oral historians are unable to read or write. A compromise situation would be one in which only those oral historians who can in addition read and write might be regarded as eligible. Admittedly, literary skills are still a departure from ancestral ways in many African societies, but even readiness to acknowledge competence regardless of formal Western-type degree would be revolutionary in African universities.

A related area is that of African languages. There are specialists in African languages who know not only how to use an African language, but also how the language behaves. Somes of these are superb teachers at university level. I know of at least one who spent many years in an American university, teaching Swahili with a sophistication unmatched by many of those who have actual degrees in the subject and in Bantu linguistics. Yet, in the United States, he could never hope to have a proper tenure appointment, or even formal rank, since he did not possess a degree. He recently returned to Kenya, but the university of his own country would not employ him either at that rank without a degree. Yet, the same university would be quite prepared to appoint a distinguished British Swahilist from the London School of Oriental and African Studies, with a less intimate knowledge of certain African languages than the Kenyan had already proved over several decades.

There is a case for broadening the criteria for recruiting academic staff to include both formal degrees and, where appropriate, indigenous traditional skills adequately demonstrated and capable of being effectively utilized on both teaching and research at university level. Clearly a hybrid of cultures is at play here, and staff recruitment could reflect this dualism.

Departments of sociology could have indigenous specialists in oral traditions; departments and faculties of medicine and preventive medicine could include specialists in indigenous herbs, and might even examine the medical implications of sorcery and witchcraft as part of the general training of a rural doctor in Africa. Departments of history, literature, musicology, philosophy and religious studies could all allow for the possibility of recruiting skills on a different set of criteria from that which has been honoured in Western institutions.

But in addition to reforms encompassing student admission requirements, curricula, faculty recruitment, there must be a broader structural transformation which relates general social needs to the educational system, and which reduces the tendency toward a pyramid educational structure with the university at the top, and everything below that being no more than a step toward the pinnacle. What is needed is a major change involving a diversification of the content of the curricula of each institution.

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[1] Okot p'Bitek, "Indigenous Ills", Transition, no. 32, August/September 1967, p. 47.

At the university level, should studies continue to be organized according to traditional western disciplinary categories? Or is there a case for having on the one hand a School of Rural Studies, encompassing agriculture, anthropology, preventive medicine in rural conditions, and the like, and on the other hand, a School of Urban Studies, examining the rural-urban continuum, labour migration, ethnic associations, criminology and relevant preventive medicine. Other possible schools could include Oral Tradition and Historiography, Languages and Oral Literature, and Religion and Witchcraft.

Informing all these reforms would be a concept of relevance domestically defined, and which related to both the economic and cultural needs of the society as a whole.

Development: The strategy of diversification

The second strategy of development is that of diversifying the cultural content of modernity. This approach rests partly on the assumption that just as economically it is a greater risk to be dependent on one country than on many, so in culture one foreign benefactor is more constraining than many. To be owned by one person is outright slavery; but to be owned by many master, who can be played against each other, may be the beginning of freedom.

The African university has to move from being a multinational corporation to a multicultural corporation. From what we have discussed, it is clear that in spite of the fact that African university systems have grown up with structural or other links with metropolitan universities in Europe and North America, the African university has continued to be heavily uni-cultural: it has been more a manifestation of western culture in an African situation than an outgrowth of African culture itself.

For as long as the African university remained a multinational corporation in this sense, it denied itself the wealth of its own society. But in order to become a multicultural corporation it is not enough to combine African traditions with the Western heritage. It becomes more important than ever that African universities should take seriously the cultures and experiments of other civilizations. The educational system should not simply talk about European history, combined increasingly with African history, but should in addition pay attention to Indian civilization, Chinese civilizations and most immediate of all, Islamic civilizations. Although Arabic is the most widely spoken language in the African continent, the language has received very little acknowledgement in the educational syllabuses of Africa south of the Sahara. It has not even received recognition from countries bordering Arabic-speaking areas, or with large numbers of Muslims among their own citizens. The Muslim community in Nigeria runs into millions, and the bordering countries contain millions more, yet Nigeria's universities favoured Latin and Greek rather than Arabic studies. As for Chinese studies, there is at most some interest in Mao Tse-tung in political science department these days, but still no interest in Confucius. Mao's China is relevant not only to ideology and economic organization, but also to intermediate technology, medicine and new methods of agriculture. A conscious effort to learn more about what is done in China, and an attempt to see how much of it is relevant for African needs could help to add technical richness to cultural pluralism.

A multicultural corporation requires not only a revival of interest in African indigenous traditions, but also a cultural diversification of the foreign component in African curricula. A twin process is then underway: increased Africanization, as the society is permitted to reciprocate the impact of the university; and increased internationalization as the foreign component ceases to be Euro-centric and attention is paid to other parts of the total human heritage.

An important subject which should be introduced into African secondary schools is the history of science. It is possible that the dependency complex among young African school children arises partly out of their being overwhelmed by Western science. The prestige of the Western world, in a continent which is very conscious of the power of prestige, derives disproportionately from Western leadership in science and technology. So great has that leadership been in the last 300 years, that Westernism and science are sometimes regarded as interchangeable.

In reaction to this Western scientific pre-eminence, some Africans have sought refuge in *négritude* as glorification of a non-scientific civilization. The leader of *négritude* as a romantic movement in Africa, Leopold Senghor, President of Senegal, has defined *négritude* as "the sum of African cultural values" informed by their "emotive attitude towards the world"[1]. Other Africans have sought answers in Marxism - partly because it seems to offer Africans the chance of rebelling against the West without ceasing to be scientific. After all, was not the Marxist heritage a scientific critique of the West? These two responses symbolize wider forces at work in Africa. The *négritudist* rebels against the scientific West by idealizing his own heritage; the African Marxist rebels against the West by embracing an alternative scientism. Leopold Senghor, a cultural nationalist, has been denounced by some African radicals as an intellectual primitivist who has tried to reduce African modes of knowledge to pure emotion and has turned the history of Africa into the story of the Noble Savage. But Senghor denies that he has deprived the African of the capacity to reason and innovate technologically. "It is a fact that there is a white European civilization and a black African civilization. The question is to explain their differences and the reasons for these differences, which my opponents have not yet done. I can refer them back to their authorities. 'Reason has always existed', wrote Marx to Arnold Ruge, 'but not always under the rational form'"[2].

Senghor then proceeds to quote Engels, whom he regards as even more explicit on this question in his work "preparatory to the *anti-Dühring*": "Two kinds of experience... one exterior, material; the other, interior; laws of thought and forms of thinking. Forms of thinking also partly transmitted by heredity. A mathematical axiom is self-evident to a European, but not to a Bushman or an Australian aboriginal"[3].

This debate between African cultural nationalists and African scientific socialists is likely to continue for the rest of this century. What the two groups have in common is a rebellion against the West and the inferiority complex which had been created by Western scientific pre-eminence. The curriculum in African schools should at some stage reflect these disagreements. But at least as fundamental as the question of whether African culture was traditionally scientific or whether Marxism is a science in the issue of how much Western science owes to other civilizations. From the Indus Valley to ancient Egypt, from imperial China to medieval Islam, the West has found intellectual and scientific benefactors over the centuries. Yet very little of this is communicated to young children in schools in Africa. The cultural pluralism which lies behind the scientific heritage is lost to these young minds, as they continue to be dazzled at a formative period by Western civilization alone. Secondary school curricula in Africa must therefore put science in its proper historical context, reveal the diversity of the human heritage, and break the dangerous myth of Western scientific pre-eminence.

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[1] See Senghor: *Prose and Poetry*, edited and translated by John Reed and Clive Wake, Oxford University Press, London, 1965, p. 34. The emphasis is original.

[2] *Ibid.*

[3] Engels as cited by Senghor, *ibid.*, p. 33.

Another major change which would need to be introduced into primary and secondary schools concerns the teaching of languages. Each African child should learn a minimum of three languages - one European, one Asian and one African. The era of learning multiple European languages - some ancient and some modern - while other linguistic heritages of the world are ignored, should come rapidly to and end.

Because of the colonial legacy, some African students in former British Africa will need to learn French and some francophone Africans will continue to learn English. Pan-Africanism will need the teaching of an additional European language for a minority of students. But any additional European language has to be a fourth language - chosen instead of, say, geography or fine art, but certainly not at the expense of either an African language or an Asian one. These linguistic requirements are partly based on the assumption that access to a culture is considerably facilitated by knowledge of its language. At the university level language requirements should continue in a modified form. Each undergraduate - regardless of the field - should take either an African or an Asian language at an advanced level. In addition he should take a course on a non-Western civilization, preferably, but not necessarily, linked to the language of his choice.

But perhaps the most fundamental of all reforms must be a change in attitude in all departments in African universities away from excessive Eurocentrism and toward a paradoxical combination of increased Africanization and increased internationalization of the content of each departmental programme. It is only in this way that the African university can evolve into a truly multicultural corporation.

Development: The strategy of counter-penetration

But domestication of modernity and the diversification of its cultural content will not achieve final fulfillment without reversing the flow of influence back into Western civilization itself: There are reformers in Africa who urge only domestication :- and some of them would go to the extent of expousing cultural autarky. But this is a strategy of withdrawal from world culture, the outcome of which would be the continuing marginality of Africa in global affairs. In a world which has shrunk so much in a single century, there will be many decisions made by others which are bound to affect the world as a whole.

For Africa to attempt a strategy of withdrawal or total disengagement would be a counsel not only of despair, but also of dangerous futility. Modernity is here to stay; the task is to decolonize it. World culture is evolving fast, the task is to save it from excessive Eurocentrism. The question which arises is how this task is to be achieved.[1] This is where the strategy of counter-penetration is relevant. If African cultures have been penetrated so deeply by the West, how is Western culture to be reciprocally penetrated by Africa?

The West has not, of course, completely escaped Africa's cultural influence. It has been estimated that the first piece of carving made by an African to reach modern Europe arrived on a Portuguese trading ship in 1504. African workmanship in leather and probably gold had a much older presence in Europe.

> "However, African art burst upon the awareness of the Western world only in the turn of the nineteenth century. Army men like Pitt-Rivers and Torday brought back large collections with good ethnographic description... No one should jump to the idea that Picasso's women who look two ways at once, or anything else about his work, is a copy of something he discovered in African art. There was little direct, stylistic influence, although some can be discovered by latter-day critics. Rather what happened was that with the discovery of African and other exotic arts, the way was discovered for breaking out of the confines that had been imposed on European art by tradition - perspective, measured naturalism, and anti-intellectual sentimentality"[2].

At least as important as this artistic counter-penetration has been Africa's indirect influence through its sons and daughters exported to the New World as slaves. Africa's impact on jazz and related forms of music has already been documented. So has the influence of African tales on the literatures of other lands, particularly of the Southern United States and the Caribbean area.

Africa's cultural influence on the West has been far more modest than the West's influence on Africa. This asymmetry will continue for at least the rest of this century, but the gap in reciprocity can be narrowed. To achieve this Africa will need allies. The continent's most natural allies consist of the Black Diaspora and the Arab world. The Arabs share a continent with black people. Indeed, the majority of the Arabs are within Africa; so is the bulk of Arab land. Black and African states share the Organization of African Unity. This organization and the Arab League have overlapping membership. There are possibilities of exploiting this relationship to the mutual advantage of both peoples. The Arab oil-producers have already started the strategy of economic counter-penetration into the West. This ranges from buying real estate in England to controlling a bank in the United States, from acquiring a considerable share in the Benz complex in West Germany to the possibility of extending a loan to Italy. The whole strategy of recycling petrodollars is full of possibilities of economic counter-penetration. As a result, the West is at once eager for the petrodollars and anxious about its long-term consequences for Western economic independence[3].

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1. Aspects of the Eurocentrism of world culture are also discussed with passion and insight by Chinweizu, The West and the rest of us: White Predators, Black Slavers and the African Elite, Random House, New York 1975. Chap. 14-16 are particularly relevant from the point of view of this article. Consult also Mazrui, World Culture and the Black Experience, University of Washington Press, Seattle, 1974.
2. Paul Bohannan and Philip Curtin, Africa and Africans, American Museum of Natural History. The Natural History Press, New York, 1971 edition, pp. 97-98.
3. This is argued more fully in Mazrui, "The New Inter-dependence: from hierarchy to symmetry", in James Howe (ed.) The United States and the Developing World: Agenda for Action, 1975, Overseas Development Council, Washington, D.C., 1975.

But alongside this risk is an opportunity for a new Third World alliance to counter-penetrate the West. Once again economic power and cultural influence might be linked. The Organization of Petroleum Exporting Countries is heavily Muslim in composition, and includes the largest Muslim country in the world, Indonesia. The largest oil-exporting country is Saudi-Arabia, where the spiritual capital of Islam, Mecca, is to be found. The second largest oil-exporter is Iran, an increasingly influential Muslim country in world affairs. Two thirds of the membership of OPEC is Muslim - but represents over two thirds of OPEC's oil reserves. Nigeria, another OPEC member, contains all three parts of the soul of modern Africa - the Euro-Christian, the Islamic and the indigenous religious traditions. All three are vigorous - and Islam is already the strongest single rival to Westernism there.

The rise of OPEC in world affairs - however transient - may herald the political resurrection of Islam. Before the end of this century African Muslims will probably outnumber the Arabs and will be making a strong bid for shared leadership of Islam. It would not be surprising if, within the next decade, black Muslims direct from Africa are establishing schools and hospitals in Harlem and preaching Islam to black Americans. The funding for this Islamic counter-penetration will probably come from the oil-producers of the Arab world. But since African Islam is distinct from Arab Islam, and carries considerable indigenous culture within it, Islamic counter-penetration into the United States would also be, in part, a process of transmitting African indigenous perspectives as well.

But at least as important as Arab money for African cultural entry into the West is the black American population. The second largest black nation in the world (second only to Nigeria), it is situated in the middle of the richest and mightiest country in the twentieth century. At the moment, black American influence on America's cultural and intellectual life is much more modest than, say, the influence of Jewish America. But as the poverty of black America lessens, its social and political horizons widen, and its intellectual and creative core expands, black American influence on American culture is bound to increase. A central task for African universities will therefore be to reach black America, and, by influencing the most powerful country of the Western world, to reach the rest of the West as well. African universities would do well to encourage more black Americans to gain part of their education in Africa. Here again, Arab money could find a new use in scholarships available to black Americans to study in the African continent, north or south of the Sahara. Later, Brazilian as well as Caribbean blacks might be encouraged to follow suit.

However, counter-penetration as a third strategy required for effective decolonization of African modernity is a longer term endeavour than either domestication or diversification, requiring conditions which make it possible for Africans to innovate sufficiently to teach others a thing or two. This counter-penetration by the whole African continent into the main-streams of cultural and intellectual skills elsewhere might begin with influence from outside into the African rural area, followed by a balancing influence from the rural areas on educational systems in Africa, stimulated by foreign cultural, intellectual and technical skills.

But the full maturity of African educational experience will come when Africa develops a capability to innovate and invent independently. Full reciprocal international penetration is a precondition for a genuinely symmetrical world culture. As Africa first permits its own societies to help balance the weight of Western cultural influence, then permits other non-Western external civilizations to reveal their secrets to African researchers and teachers, and then proceeds to transform its educational and intellectual world in a manner which makes genuine creativity possible, the continent will be on its way toward not only decolonizing modernity, but also helping to recreate modernity anew for future generations.

EDUCATION AND THE MAN OF THE FUTURE

by M.I. Kondakov

The fundamental condition of social and economic progress is the education of new generations. The right to education ensures the harmonious development of the personality, the full realization of one's potential and creative ability, and the free choice of a job.

Nowadays, when social and economic development and education have become inseparable concepts to which great attention is paid, the turning of words into acts in this field is proof of cultural development and the concern of the ruling classes for encouraging the development of man and society.

Socialism has opened up to the new generations and all the workers, access to knowledge and spiritual wealth. In the socialist countries the right to education is guaranteed by the fact that is is open at all levels and free in all forms, and by the development of higher and secondary schools for general, professional and specialized education, by the extension of all forms and structures of adult education, by the setting up of a diversified network of out-of-school establishments for children and by a whole set of conditions and advantages which are the expression of the democratic and humanitarian essence of the socialist system of education.

The continual rise in the level of culture and spiritual needs of man, and in the possibilities provided by society for satisfying such needs, are one of the basic laws of socialism. As proof of this, we may mention the fact that every citizen of the Soviet Union is now familiar with the wealth of universal culture.

In 1939, out of every 1,000 people employed in the U.S.S.R.'s national economy, 123 had undergone higher or secondary education (whether complete or incomplete), as against 433 in 1959 and 767 in 1976. The differences between the level of general learning and culture between various social strata and groups have been considerably narrowed down. Whereas in 1939, out of 1,000 workers 44 had undergone higher or secondary education (whether complete or incomplete) in the sector of manual labour and 512 in the sector of intellectual labour, in 1976 these figures were 684 and 968 respectively. In the U.S.S.R. the attainment of universal secondary education is virtually completed. In 1978, over 97 per cent of the pupils who had been enrolled in the primary schools, had completed the entire secondary-education cycle.

One of the factors in the development of Soviet society is the great interest taken by the citizens in learning and raising their level of culture.

In 1977-78, over 93 million people benefitted from education in all forms, including 45.5 million students in general-education schools. The material infrastructure has been greatly strengthened. Between 1918 and 1975 108,515 schools have been opened, with a capacity of 38 million students.

The government is spending large sums to build schools and provide them with modern facilities and equipment. In 1978, the national budget for education was close to 17 billion roubles.

Reading and books are very important in the spiritual and ethical development of a human being. There are at present 350,000 libraries in the U.S.S.R.. including 131,000 public libraries with a fund of 1.6 billion books.

Each year, 2 billion books and brochures are published, written in all the ethnic languages of the U.S.S.R.

Art has come to play a basic rôle in the life of the Soviet citizens. There are 135,000 clubs and 1,323 museums in the country. In 1976 alone, these museums were visited by 135 million people. In summing up the development of science and culture throughout the years of Soviet rule, L.I. Brehnev said "This meeting, which was the dream of the most eminent minds of the human race, the historic meeting between labour and culture, occurred. This was a turning-point in the history both of our country and of universal culture".

The Constitution of the U.S.S.R. sums up the main educational achievements and indicates the concrete paths of its future development. Article 45 declares: "The citizens of the U.S.S.R. have the right to education. This right is guaranteed by the fact that education is free in all forms, by the institution of compulsory universal secondary education for young people, by the major extension of professional and technical training and specialized-secondary and higher education, bringing education into line with real life and production conditions; by the development of correspondence studies and evening classes; by granting State scholarships and other advantages to pupils and students; by the free provision of school textbooks; by making possible schooling in one's mother tongue; and, by promoting conditions permitting self-instruction".

The institution of compulsory universal secondary education for the second cycle is a major innovation. It represents a major advance, since the expansion of socialist production and the development of society cannot take place without the aid of workers having a high level of instruction and working in various spheres of social and political life.

Compulsory secondary education raises the level of knowledge and culture of the Soviet citizens, and their professional qualification enables them better to solve economic and social problems. To follow the path of secondary education is not only the right but the duty of all the young.

The goals and tasks of education depend on social and economic development, and the requirements of social, scientific and technical growth. The Soviet system of education aims in particular at the full realization of the human personality as a result of scientific and technical progress and production efficiency.

At the present time the Soviet system of education is characterized by its overall approach to questions such as the modernization of education as a whole, the search for ways and means of intensifying the schooling and educational process, and the perfecting of methodology. As a result of the scientific and technological revolution, there is a need to raise the level of qualification and general training of the workers. The contents, structure and duration of education are altered. As a result, we have witnessed, on the social level, a change in the assumptions, conditions and meaning of education, and in the function of educational establishments. In the end, it is the way of looking at the school's rôle in relation to the socialist society and the individual which has been profoundly changed. The concept of a completed learning process and of education determined by the change of generations makes way for the richer concept of continuous learning pursued throughout a creative lifetime. Education and schooling no longer serve merely, as in the past, to provide youth with the means of facing life, but become an integral part of the socialist reality.

The aim is to give meaning to the scientific and technological revolution by developing an harmonious personality which is itself the determining factor in its rapid progress. The socialist society provided satisfactory answers to this aim. The U.S.S.R. has the greatest number of scientific workers, nearly 1.3 million. In 1977, 1,932,000 specialists entered the national economy, of whom 752,000 were higher-education graduates.

In the conditions created by the increasing development of science and technology, endeavours are being made to transform the nature and contents of work and to make more rational and profitable use of spare time, and more attention is paid to cultural matters. This can be explained by the fact that it is precisely his social relationships and way of life which are the source of man's strength and potential, and of the deployment of "human resources" which bring about the scientific and technological revolution. This revolution, in turn, brings about basic changes in work attitudes, leading to its intellectualization and giving it a creative content. More and more society is feeling the objective need to create a new type of worker whose basic qualities are not merely skill, know-how and experience, but all of these aptitudes backed up by diversified, constantly enriched knowledge.

Whatever be his speciality, the path to perfection open to a worker can be summed up as follows: improvement of specialized knowledge (based, obviously, on a specific basic training), by enriching this knowledge with the acquisition of general knowledge.

All this has led to major changes in the organization and structure of the schooling and educational process at all levels. The school has opened up not merely to new contents, methods and technical facilities, but also to new forms of organizations which ensure satisfactory assimilation of knowledge, the full development of skills and know-how, and the possibility of finding one's bearings in the midst of the wave of new knowledge. Changes in life style have led, in pedagogics and psychology, to research aiming at working out an active teaching process bringing out everyone's personality and providing favourable conditions for development of the pupil's abilities and cognitive faculties. All this has been made possible by the emergence among the masses of spiritual needs such as the search for creativity and the desire to establish a scientific grounding for reason and constantly enrich one's knowledge. These aspirations have an obvious social value, since complete application of the potential of the scientific and technological revolution and the employment of its achievements for the benefit of mankind depend in large part on the intellectual level of society and the results obtained by the entire education system. This creates new problems in all fields of culture, learning, education and training. Improvement of the socialist system of education depends on the solution which will be found to these problems. Moreover, the task faced is the complex task of forming a new type of man, thus highlighting the rôle of general and professional training.

To the extent that the school prepares the future, educational growth is worked out relatively in advance of present requirements dictated by mass production. For this purpose, a whole series of determining circumstances connected with the scientific and technological revolution, are taken into account. Our assumptions are that, firstly, the growth of science is one of the aspects, one of the forms reflecting the advance of the productive forces of society and the human personality. And, secondly, that during the ten years required for the pupil to go from the ABC of knowledge to the principles of social development, and from the multiplication table to differential and integral calculus, the volume of knowledge required continually increases, and the volume of information increases, at the very least, twofold. New sectors of science come into being, and knowledge becomes more thorough. Thirdly, it can be noted that the practical application of the achievements of science and technology is taking place ever more rapidly. We may mention a few examples which have become classics. It took over 100 years after its invention for photography to come into common use (1727-1839), over 50 years for the telephone (1820-1876), 35 years for radio (1867-1902), whereas only 15 years were required for radar (1925-1940) and 12 years for television (1932-1944). Six years went by between the scientific conception and the creation of the atom bomb (1939-1945) three years for the transistor and less than two years for lasers.

The training and refresher training of executives have had to be re-examined in the light of the vitality of science and the rapid application of its achievements. So little time is required to create a new technique and apply it to production that it is becoming essential to train workers to assimilate all innovations and be able to master them in a very short time. Such results cannot be obtained by professional habit or knowledge restricted to the speciality field, but mainly by the basic and diversified nature of general and professional training.

To form a new type of man, a radically new school is required, which is at present being developed. Its various aspects are subjected to experimental testing or are still at the stage of theoretical design. One may assert that the future is being built today by putting to good use the basic principles of the socialist system of education. The scientific and technological revolution has once again shown the importance of basic general training and its methodological orientation.

At the 25th Party Congress, the Secretary General of the Central Committee of the S. U. C. P., L. I. Brejnev, mentioned in his report: 'It is obvious, among other things, that we must greatly improve the entire general education system, and in particular, the secondary school. In the present conditions, where the volume of knowledge required by a man is increasing rapidly, it is no longer possible to bank chiefly on the assimilation of a certain number of facts. Each student must be inculcated with the ability to enrich his knowledge and find his bearings in the midst of the overwhelming flood of scientific and political information".

The necessary conditions for solving these problems seem to have been satisfactorily attained especially in the U. S. S. R. and the socialist bloc. The conditions are created chiefly by the development of general education and the level of the material and pedagogic infrastructure of general-education institutes. Moreover, we should point out that in our country, the training of a fully educated worker meets production requirements but is also a social necessity.

It is important in itself to look at the creative side of work. The rapid transformations, interactions and changes in various technological processes, and the technical application of laws developed by various branches of knowledge require the working out of an education system making possible the practical application of scientific achievements within production processes, acquainting the pupil with the techniques he will be faced with on completion of his studies, providing him with a structured set of habits and know-how, and training his will to work. This is why the Soviet school, in defining in school curricula and textbooks, the connections existing between ideas, laws, concepts and the material employed, and in delving more deeply into these rules and concepts, endeavours to enlarge and strengthen the polytechnical nature of secondary education.

There is frequently a misunderstanding concerning the real meaning of polytechnical education, which is reduced to a mere means of obtaining access to technology or basic work habits. V.I. Lenin emphasized two aspects of polytechnical education. In the first place, it provides acquaintance with all the achievements of science and technology, as well as experience in production, and it is only on the basis of such knowledge that man will be able to master the production process and scientifically organize work; in the second place, such education permits conscious assimilation of the innovations and facilities which are those of socialist production. "The principle of polytechnical education", said Lenin, "is not to learn everything, but to acquire a grounding in the basics of modern industry in general".

The social economic significance of the principle of polytechnical education is bound to increase as time goes on, since one can only enrich the pupil's social relationships, guide their awareness of socialism, and give a meaning to their insertion in a collective activity corresponding to their potential and interests, by dominating, both in practice and theory, the scientific grounding for production and the objectives of modern technology.

Wholehearted application of the polytechnical principle will make it possible to bridge the gap separating vocational education from general education, and will provide the pupils with a mastery of their job.

Man must meet new demands and improve his knowledge and vocational training as science develops.

In the years to come, special attention will be paid to raising the scientific level of general education, that is, of the education providing an initiation to the basic principles of production and the technological applications of the rules of biochemistry, biophysics and mathematics.

The analysis of the school curricula for the scientific and mathematics cycles shows that the polytechnical education provided for the pupils can be improved. For example, over the last few years one could find in the physics curriculum the theory of relativity, the theories of molecular physics, kinetics and electronics, high-energy physics, quantum radiophysics, high-pressure physics, semiconductors, spectroscopy, etc. Methods in physics (both experimental and mathematical) have been thoroughly revised. All these questions rank as polytechnical education all the more so in that they form the basis of subjects such as radioelectronics, nuclear energy, missile and semiconductor, technology, automation and telemechanics, computer techniques and metering control.

With this outlook in mind, mathematics, chemistry, biology and other lessons have been altered. We have also extended the field of school and out-of-school studies relating to the use of electronic calculators, which require the pupils to perform calculations of an operational type.

In this way the pupils acquire a knowledge of the general operating principles of automated production and of the systems which enable it to be controlled and managed. All this can be achieved by the school curricula and out-of-school studies related to science and technology, and in socially useful work performed by the student integrated into the production process. In our time we can witness the interdependence of the various sciences. This requires a strengthening of the links existing between various subjects and an interdisciplinary approach.

A consequence of the scientific and technological revolution is the increased interaction between the scientific, technical, organizational and economic bases of modern production and the study of the humanitarian and scientific foundations and formation of the human being. As we move towards the 21st century, the number of workers employed in automated production processes is greatly increasing. Already, the workers are dealing less with the objects of work than with information concerning the rapid and continuous evolution of production processes. To better fix and control these processes, man must perfect the basic, polytechnical and cultural training which will provide him with access to the information and the ability to process it satisfactorily. This means that the psychological and physical potential of the human being, his esthetic tastes and other qualities must be reconciled with the present state of technology.

Around the year 2000, the pupils will be able to perform more work in laboratories devoted to contemporary technology (cybernetics, electronic, radio engineering, bionics, ergonomics, etc.).

If the school and the entire education system tend, while inculcating the bases of science, to acquaint the pupils, both theoretically and practically, with the scientific foundations of the main branches of production, and to intensify practical and laboratory work and encourage frequent visits to the places of production and voluntary studies of a scientific and technical nature, they must pay special attention to the educational nature of job-oriented teaching. The most important aspects of such teaching should be those emphasizing self-reliance, encouraging theoretical reflection, establishing the habits necessary to work planning and organization, and leading to creative activity and the conscious choice of an occupation.

However, while it is essential to improve job-oriented training within the framework of material production, it is also essential, we may repeat, to provide the young people with thorough basic knowledge, since vocational training is less and less able to do without competence in sciences such as physics, chemistry, biology, mathematics and other sciences included in the schooling plans. It is no chance if the Soviet government proposes to restructure the vocational and technical education colleges into school establishments providing not merely vocational but also general education, and is doing so with success. The success of this radically new type of establishment can be judged from the following figures; there were 124 ten years ago, and today there are 3,500 of such schools. They now train 1,700,000 pupils. These colleges determine the profile and orientation of all vocational and technical education, which covers over 100 occupations.

Although there still exists in the present production system a large amount of monotonous labour requiring no skill, requirements relating to quality, the cultural aspect, the accuracy and economy of the operational phases, are continually growing.

These requirements can only be met by a high basic and cultural level of worker training. This is why it is becoming essential to develop and perfect education by linking together the streams and options of general training with those of vocational training.

Research has shown that solid qualification depends on general training. V. A. Jamine and G. A. Eguasarian, in their book entitled "The Economic Impact of Skilled Labour", show that the importance of the factors affecting improvement of qualifications can be broken down as follows: influence of age group 0.2 per cent; length of time in job 3.2 per cent; vocational training course 5 per cent; general education backed up by experience on the job 29.6 per cent; general education backed up by training in vocational and technical education colleges 61 per cent.

Developing the system of vocational and technical education does not mean reducing the various forms of vocational training, especially that consisting in improving job qualification on the production site. This represents a huge task. In 1975 alone, 5.5 million people acquired an introduction to new occupations and specialities on the production site, and 16.5 million workers followed various forms of training in order to improve their qualification.

To ensure the harmonious development of the personality, it is essential that one choose one's job well. Polytechnical education, because it acquaints the pupils with the major branches of modern production, helps improve the work of job orientation, and fix vocations. The chief motivations are the ideology guiding the choice of an activity to be performed in the interests of society, and the certainty, which every human being must have, of taking part in the development of the spiritual and material heritage.

In this time of scientific and technological revolution, it is essential to permit the full realization of the talents and potential of the most gifted young people. This is only possible on the condition that education is democratized, and that access to it is opened, at all levels, to all the citizens. Talent is an inestimable national value, and the school accordingly has all the more responsibility for it. It is in school that the child's curiosity and gifts are awakened, and that talent is revealed. The school should accordingly have all the facilities enabling it to train and develop the child's potential, to strive for and encourage the realization of talent, and guarantee his growth in an environment which will make him an accomplished citizen.

To give scope to the creative potential of a school pupil, he must be made to take part in creative activities, and his personal studies (theoretical, practical and laboratory work) must be intensified taking into account the pupil's peculiarities, tendencies and interests.

For this purpose optional studies have been introduced into the school plans, and an organization has been provided for in the schools to permit thorough study (both theoretical and practical) of mathematics and calculation techniques, physics and radioelectronics, chemistry and its technology, biology and agrobiology, and the humanities.

There are plans to extend various forms of out-of-school studies both in the field of technology and that of the artistic education of youth.

The education system of tomorrow will have to organically connect the passion for science and technology with the love of nature, the diversified development of intelligence with the development of feelings, and physical training with moral purity. In each human being intensity must be lent to the need to know, curiosity for the discoveries of science, technology and culture. The inspiration for the school of the future shall be romanticism, the romanticism of the struggle for knowledge, of scientific research and the creative work of pupils, in all its forms. This will be an influential factor with respect to the perfecting and quality of the education process.

The future will maintain and increase the decisive rôle of the Soviet public education system. At the same time, the family and the various public institutions will take more and more part in the tasks of schooling and education. These objectives will be able to be attained, since the people's level of culture and educational will have been raised, the length of the working week will have been shortened, and the principle of democracy will have been developed, thereby increasing the influence of social institutions in all spheres of social life.

Great stake is also placed on raising the people's pedagogic culture, which at present concerns millions of people in various ways.

We are bound to seriously criticize the concept of the "school-less society" put forward by certain sociologists and pedagogues and sanctioned by the Western futurologists.

The complete remodeling of the contents of education and the search for new forms and methods of teaching imply certain changes of structure in the education systems. These changes will be manifested by a certain decline in the importance of the school and a greater balance between the rôle played by the school and the rôle played by the family and public institutions, but also by the rapid growth of already existing forms and the appearance of new methods of teaching intended for adults. We may mention as an example the success of the people's universities, which cover various branches of knowledge and operate, on a voluntary basis, the cultural institutes and other learning establishments which are used by millions of people. The consequence of this will be to extend and lend flexibility to a single form of education, adapting it to the problems posed by age, social group, and regional characteristics.

The ever greater need felt by the worker to enrich and update his general and specialized knowledge is, on the one hand, a part of his creativity throughout his working life, the foundation of his job mobility and the condition of efficient work.

Continuing education may be regarded as the result of complex changes in the contents of work, and the ever greater part played by the intellectual functions in work. Because they will form an integral part of work, adaptation to new intermediate jobs, retraining, higher training, additional education, dissemination of scientific knowledge, etc., will develop greatly.

All these aspects of education are at present widely spread throughout the USSR. For example, 645 people benefitted from such education during the school year 1914-1915, 9.5 million in 1940-1941 and 32.2 million in 1974-1975.

Correspondence schooling and evening classes have altered in quality following the attainment of compulsory universal secondary education. They must be further improved and adopt as their objective, firstly, meeting the increasing spiritual requirements, and subsequently, providing a general training on which the worker's self-realization depends, whatever be his job.

This trend can be verified by examining the number of enrolments for evening classes in general-education schools in the U.S.S.R. In the classes for 7- and 8-year olds, for the school year 1940-1941 there were 110,000 enrolments, for 1970-1971, 3 million, and for 1975-1976 5.7 million.

Accordingly, the number of enrolments in these schools increases the number of pupils in the 8th grade (last year of school), and the schools themselves become one of the links in the continuing education process. They are effective to the extent that they raise the level of general training, and permit the acquisition of new knowledge and the raising of qualifications.

Modern technology gives rise to new production structures and opens the path to social progress. Living and work conditions will be profoundly changed as we approach the 21st century. A great deal of research has been carried out on the topic: "The scientific and technological revolution and education". An abundant literature is available. Frequently this literature betrays technocratic tendencies, and the influence of the scientific and technological revolution on education is not tied up to social problems. In fact, it is on the interaction between scientific, technical and social progress and the humanization of the scientific and technological revolution itself that the positive aspects of this influence and the optimum development of mankind will depend.

In the years to come, education will be characterized by the setting up of all the conditions to permit harmonious realization of the human personnality. To solve this problem satisfactorily, one must make a clear distinction between "harmonious realization" and "diversified realization". Harmonious realization, which we assert to be an ideal and the statutory standard supplementing diversity (the faculty of bringing together in a single whole intellectual and physical labour, and at the same time developing physical and ethical strength and potential, including training acquired during esthetic activities and physical training) implies that an individual take part in all social relationships, inasmuch as an active subject, and this is only possible for each individual in given social conditions.

For the ideal of harmonious realization to be attained in practice, specialized pedagogic and social units will have to be set up, and theses for which forecasting experiments are already being made will have to be prepared. Only a set of social institutions (for general education, sport, music, art and other schools, technical centres, clubs permitting a choice of activity, nature studies, work collectives in production groups and firms connected with social services and organizations, creative circles, etc.) can ensure for everyone a self-realization which will be both harmonious and diversified. Such sets, after the best of them have been tested by experiment, should become the chief component in the life of the entire people, and be the starting-point for a renewal of the relationships between the various age groups or social strata.

- These sets should be developed, at the same time, with a view to meeting the requirements of adults in their creative activity, which is important in the conditions of improvement of material well-being and use of spare time. General-education institutes, vocational training schools and establisments designed for adult learning may form part of a single set. It is essential to perform calculations justifying the setting up of such a set according to population density (probably between 25,000 and 40,000 people in the large towns and between 5,000 and 10,000 people in the future farming towns).

The age regarded as the age of maturity will no doubt tend to be lowered. One may imagine that at age 17, that is, on completing secondary education, nobody will any longer encounter professional barriers, and everyone will be able to benefit from the rights possessed by citizens who have attained their majority. The problem is rather sticky if one considers that nowadays, in many countries, the age of majority is 21. Factors which must be taken into account here are the medical and biological aspects (health must be protected, complete physical development and genetically healthy descendants must be ensured, the number of hereditary diseases must be reduced, etc.), but the basic aspect remains pedagogic.

Over the last few years, the volume of education has greatly increased and in many cases led to an overload of schoolwork. Many pedagogues have described this overload, and its consequences on the physical, intellectual and emotional development of children. For the time being, no solution has yet been found. This can be explained by the fact that the removal from school curricula and textbooks of numerous data of secondary importance or out of date, has triggered, by way of reaction, an increase in the references dealing with the most recent scientific discoveries and concepts. In this way the volume of new material is greater than the volume of subjects which have been eliminated, while the age limit which determines the completion of secondary education remains unchanged. The increase in scientific knowledge cannot go on, and it will be virtually impossible for the real potential of the school and its pupils to keep up with it.

It is becoming clear that the increasing volume of information in the school should be the object of a study with a view to generalizing knowledge in relation to education requirements, changing school materials in a didactic and methodical way, and enabling all age groups to have access to this material.

For this purpose, use must be made of the enormous practical experience acquired in the schools, and the new potential of the child. This will permit, according to the famous psychologist L. S. Vigotski, the organization of schooling which will not merely tag along behind the child's psychic development, but on the contrary move ahead of it and lead it on.

A few words concerning the higher-education institute. Its peculiarity is likewise to go beyond present requirements and consider the level and contents of specialists' training in a foreseeable future, and to create the conditions which will permit the specialist to perform a creative activity throughout his life. For this purpose, the specialist must above all have an initial training level based on highly diversified knowledge (on completion of higher studies), since the broader, deeper and more varied the level, the more the specialist will be mobile and open to innovation.

The failure of the initial level to match the level required by progress denotes a certain incompatibility at present existing between the training received by specialists and the new requirements with which they are faced. This holds up their professional "progress", and lowers their research potential, openness to theoretical and practical discoveries, and job mobility. For higher education to be improved, it must reject narrow specialization, and broaden and deepen theoretical and general training. This is one of the basic tasks of higher education. The gap separating the V. U. Z.[1] curricula and the level of science and technology can only be bridged by linking together the education, scientific and research processes, in conjunction with modern laboratories, advanced institutes and design offices. Over the last few years, the higher school seems to be having success in facing up to its new duties, which are the result of radical changes in science and technology and consist in improving specialists' qualifications and retraining.

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[1] V.U.Z.: Higher Education Institue.

Post-school education has been worked out for the intention of practically all specialists, including those employed in the sector of scientific research. The great success of this achievement highlights a general trend: a specialist's activity can only be rewarding if he teaches himself personally and throughout his life perfects his knowledge and habits.

In the socialist countries, post-school education has the following characteristics:

- additional education to acquire knowledge in other branches of science and technology;
- retraining designed to train specialists to cope with new trends in science and practical applications;
- and, the raising of qualification on the basis of scientific achievement and practical experience.

In the U. S. S. R. there is a single government system for retraining and further training of specialists. It included central institutes for executives in positions of responsibility, further training institutes attached to the ministries, faculties attached to higher-education institutions, and a broad network of higher-training courses in conjunction with industrial and agricultural firms and organizations.

For example, the system for retraining higher-education teaching staff consists of 114 faculties, the institute for higher training of pedagogics and psychology teachers, attached to the School of Teaching Sciences of the U. S. S. R., and eight institutes for higher training of social-science teachers. Every higher-education teacher can devote himself, every five years, to the improvement of his methodological and scientific level.

The scientific and technological revolution consists in unifying and linking the basic changes in all branches of science and technology, the worker's duties, and the position of man in a working framework. This latter condition is the most important one, since the discoveries of science and technology are merely the result of the creative genius of mankind, man's activity, and a connection between the force of knowledge and the force of work.

It is in the human being and social relationships that are brought together the sources, active forces and achievements of science and technology.

The scientific and technological revolution and social progress oblige us to constantly improve and develop education, disseminate scientific knowledge and cultural values, and lay the theoretical and organizational bases for continuing education.

This requirement of life itself is written in article 20 of the Constitution of the U. S. S. R. which asserts: "In accordance with the communist ideal: 'the free development of each individual is the condition of the free development of society as a whole', the State sets itself the objective of extending the citizens" real potential for applying their creative energy, capacities and gifts, and harmoniously developing their personality.

THE FUTURE OF EDUCATION

by Bogdan Suchodolski

It is foreseeable that the development of science and technology is going to have a growing influence on the work of increasing numbers of people. In these circumstances, we may expect the general level of education to continue to rise. We may also predict that the structure of education will undergo change, affecting in particular the division of labour between in-school education of children and adolescents, and lifelong post-school education. For this is the only way workers can hope to keep pace with the rapid progress of science and technology and the new demands being made on people in their jobs everywhere. Solving the educational problems thus outlined will be the chief task of education and social policy in the coming decades.

The vision of a "school-less" or "de-schooled" society is unlikely ever to become a reality, but we should nonetheless expect major reform in the system of compulsory schooling; this reform should take account of the possibilities opened up by new teaching techniques, as well as altered background cultural conditions and real opportunities for further education. We should certainly expect to see a major change in higher education, which will cease to be a school for young people of a specific age, becoming instead a centre of lifelong education and further training for people of all ages.

I do not think, however, that the most important and most burning issues affecting education in the future are restricted to those mentioned above. I think we are going to have to tackle - and this is already very clear today - the problem of the quality of teaching and of its individual and social rôle. The themes dealt with in paragraphs 1 and 2 are based on the principle that education is desirable, or even necessary, from the point of view of providing people with vocational qualifications. Education is an auxiliary ("instrumental") service. But there are now signs that it is tending to become, on occasion, a non-instrumental, autonomous, independent service. This means that people aspire to it not for the occupational or material advantages to be gained from it, but because it satisfies their need to know and broaden their outlook on the world, making life more dynamic and more interesting.

We accept that it is highly desirable, both from an individual and from a social standpoint, to develop and popularize demand for education for its own sake. This task is directly connected with all the different searches now going on for ways to extricate contemporary civilization from its present dead-end, by which I mean the identification of life with consumption, the tendency to bow to a superficial mass culture, to fall prey to alternate states of boredom and artificial excitement. There is a reason to fear an amplification of these negative factors, in an affluent, leisure society, in the very near future. The contemporary movement of youth protest - which is highly diverse, moreover - represents a criticism not just of a productivist society's lifestyle, but of a consumer-oriented lifestyle also. This criticism demonstrates, furthermore, the importance to education in the future of formulating a positive lifestyle. It is my belief, precisely, that education considered as an end in itself could have a big part to play in the educational model in question.

This model of the society of the future is sometimes referred to as the "learning society". I have nothing against this term, provided we realize that it is meant to refer to a society in which citizens learn and perfect their skills not merely in answer to occupational requirements but also because they conceive education as an independent value, as a precious and interesting form of existence. We should be on our guard, however, and examine the conditions of any such society with a critical eye, lucidly appraising the possibilities of its emergence. While increasing social pressure for vocational training is to be expected, it is hard to perceive clearly, as yet, factors militating in favour of more generalized disinterested education.

This is why the fundamental task of social and pedagogic research is to spell out the appropriate conditions for stimulating and generalizing disinterested demand for education. Analysis of these conditions ought to embrace both the situation in schools, where all too often - even to this day - centres of interest are eliminated and the human personality sterilized, job situations, where - until now - people are too unilaterally oriented towards material success, as well as taking social situations into consideration, where again until now attention has almost exclusively concentrated on anything that can be justified by narrowly utilitarian criteria. This kind of analysis of conditions ought to supply us with the information needed to devise social and educational policies to improve the chances of a "learning society" - in the broadest meaning of the term - seeing the light of day.

There can be no doubt whatever that the prospect outlined above is closely bound up with a definite philosophy of life and, to be more specific, with a definite choice of fundamental values in life. Contemporary civilization has too one-sidedly emphasized man's "functioning" and underestimated his "existence". Contemporary man generally has a pretty good idea of how to participate in the creation of contemporary civilization, but he does not know how to be happy in it. He is capable of playing a determinate rôle in its mechanisms, but he has no idea of what it is to be a person of outstanding character and personality. Obviously it is very important to be able to do something, but it is just as important to be somebody. By which I mean that education ought to play an essential part not merely in teaching people to work hard and efficiently, but in turning them into men and women of character also. Human happiness - and what else can educators be seeking, in the last resort? - consists not merely in serving civilization and helping it to flourish, but also in being capable of living in it. The programme aimed at popularizing disinterested education ought to permit the fullfillment of one major factor of any such life. Naturally, there are other factors too. But it is important that men realize that life is worth living, because there is always something to learn.

LONG-TERM PROSPECTS FOR THE DEVELOPMENT OF EDUCATION

by Berislav Sefer

Long-term prospects for the development of education are a very broad theme fraught with dilemmas and challenges. Education has for years been one of the fields engaging the attention of all countries irrespective of their social and political system or development level. It has been the target of severe criticism, the realm of reflection on its future.

Education is not a neutral agent or a mere product of society and social reproduction (in the material and social sense). In all societies it has been oriented and ideologically as well as politically involved. Education is to a high degree dependent on the development of society, socio-economic and political relations. In so complex social, political and economic conditions as the ones prevailing in the world today, an analysis of the future prospects for education is all the more complex.

The United Nations Development Decade in the eighties will have to differ substantially from the two previous decades. The past two decades were very preoccupied with economic growth, paying very poor attention to integral economic and social development. Nor did they create any favourable international circumstances that would stimulate progressive economic and social development in all countries, with a particular emphasis on the developing countries[1]. The preceding two decades did not create a favourable environment in global relations, least of all economic, that would foster a comprehensive economic and social development of each individual country. Evidently, the contradictions of the contemporary world have piled up so much so that the new Development Decade has to be preoccupied with a new development strategy in toto.

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[1] For the purpose of this paper as developing countries are understood all countries with low and medium income per capita. To wit; their development differed from that of the developed countries [industrialised and those with high income]. The developing countries still have to create conditions by means of changes [material and social], to be able to satisfy their most elementary needs. In fact, most of them live in a state of stagnation, i.e. in the conditions of 'non-development', for which reason in the present-day world realities the developing countries should be distinguished as a separate category in relation to the developed countries. Of course, this does not mean that the developed countries are not continuing to develop. But they have reached a high level of development; they are, so to say, 'mature in the sense of development' with many years of development behind them. They have thus reached the level of development enabling them to very comprehensively and fully meet their own needs.

The need for a new development strategy equally applies to education. Certainly, the significance of economic growth as the essential precondition for the attainment of social progress should not be underestimated. However, the development strategy for the eighties must give full attention to ensuring international conditions, foremost economic, to secure better conditions for an all-round economic and social progress of all countries, particularly of the developing countries[1]. In the new developmental strategy education assumes new dimensions as compared with those in the past decades. Education and educational systems in all countries are going through a peculiar crisis. Also going through a crisis in advanced capitalist countries and in most of the developing countries are socio-economic and political relations. However, international relations, particularly international economic relations, and the prevailing international economic order, are likewise going through a crisis of their own The crises of education and educational systems constitute a specific form of the global crisis in the world manifest in various sectors such as energy, raw materials, food, environment, etc. Education as a large social subsystem has been developing in the majority of countries in the conditions of crisis-ridden social relations, regarding both the prevailing social systems in certain countries and the crisis of international economic relations. The crisis situation in the global sense of the word is an environment in which also the crisis of education occurs.

The future world has to be different from our present times. School and education will be sharing the fate of the global social changes that are to take place in the forthcoming long-term period. Although educational system is an inseparable part of the totality of social relations and global development, in the future it can, and simply must, have a significantly active rôle in the changes that await the world. Education has to develop and educate a comprehensive person, a complete personality for a society which is still not with us but which is being created through the inexorable historical flows. School and education alone will not solve the destiny of the future world, social relations or international relations. Nevertheless, school and educational system can contribute to the solution of the accumulated social contradictions and various options facing the world.

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[1] By development we understand the process of quantitative growth and qualitative changes. This, then, is the process of changes, mutually interlinked and conditioned, quantitative and qualitative, unfolding on the basis of inherent social laws. Development always proceeds under the influence of various social contradictions. In consequence it is not a linear, non-conflicting process. The blind spontaneity of social laws of development does not ensure a stable progress and prosperity of people. It is therefore essential to secure conditions in which people cognizant with objective social laws conscientiously guide development towards greater prosperity, social justice and security of man.

SECTION I

The present state of affairs in education is characterized by a tremendous boom. In the developing countries a likewise process of very intensive expansion of education is unfolding but this expansion is of a different character from the boom in the advanced capitalist countries. Because of the limited space we shall not elaborate on the figures involved in such an explosive expansion of education; besides, these figures are widely known[1]. The coverage of children and youth by education is very high in the developed countries and very low, despite the expansion of education, in the developing countries. In the early seventies elementary education in North America, for example, embraced 98 per cent of the generation (practically all children), secondary-school education 92 per cent and higher education 45 per cent. In the same period in Africa, for example, 40 per cent of children were covered by elementary education, 15 per cent by middle-school education and only 1.3 per cent by higher education. The glaring disproportion is self-evident. The difference is striking if only whole continents are compared, but it would be even far greater if we were to compare individual countries. The duration period of youth education is becoming longer. This is generally true for all countries. However, in spite of the lengthening education of the youth in the developing countries, it is still short in comparison with the length of education in the developed countries which is being notably extended all the time - a statement supported by the data on the youth coverage by higher education. About one third of those graduating from higher educational institutions in the developed countries take up post-graduate studies, which means that these young people (making some 15 per cent of the entire generation or ten and more times higher coverage of the post-graduate students in North America from those undergoing higher education in Africa), continue in the process of education divorced from the active work process for full 18 years. Expenditure for education is growing horrendously. In advanced capitalist countries the expenditures on education in the early sixties amounted to 3.5 per cent of the GNP, while in the mid-seventies they were 5.2 per cent of the GNP. In the developing countries these education outlays in the early sixties made up about 2.7 per cent in order to reach some 4.2 per cent of the GNP in the mid-seventies. The regional unevenness of the expansion of education is in disproportion with the cadres requirements. In the developed capitalist countries a large number of graduates whom the educational system turns out every year exceeds the demand and a considerable portion of them fills and constantly swells the reserve labour army. In the developing countries the shortage of personnel continues still to be one of the factors limiting development.

Although the enormous expansion of education is characteristic for the contemporary world, its causes, consequences and problems are diverse.

The educational boom in the most advanced capitalist countries is increasingly becoming the reflection of the crisis of the overall social relations rather than an objective requirement deriving from the scientific-technological revolution. Such a boom is to a considerable extent the result of the interest of the most powerful capital, which is thereby enabling the middle class to win through acquiring higher education better positions in the hierarchy of professions in place of its decreasing importance in the capitalist enterpreneurship[1]. Furthermore, through prolonged and massive education of the youth, the pressure is being reduced for some time on the labour market which is characterized by a large reserve army of labour. Education is increasingly becoming a producer of skilled labour which the market cannot absorb. It is therefore evident that the reasons for massive and extended education of the youth in the advanced capitalist countries are not to be sought predominantly in the technological revolution but in social contradictions in the developed capitalist countries. More than 50 per cent of faculty and college graduates are not working in the occupations for which they had been trained. The educational boom has not solved the problem of manpower profiles such as engineers, doctors, etc., the demand for whom is still outstripping the supply, while it is overproducing white-collar profiles, first of all lawyers, economists, etc. The gap in income distribution, notwithstanding the growing educational level (whereby potential performance abilities are evening out), has not undergone any substantive changes, while the social mobility at the inter-generation level is more or less the same as fifty years ago[2]. To a great extent, then the educational boom is the result of the present juncture in the capitalist economy of the advanced countries, whose interest is to satisfy through expanding education, first and foremost, the petty bourgeoisie and its opposition in society and economy and to keep young people as long as possible away from the work process and labour market. Parallel with it is the practice of artificial expansion of investments for non-manufacturing purposes accompanied along those lines by rapid growth of non-industrial employment bearing the distinct features of the bureaucratization of society. Evidently, the middle class interests concerning educational opportunities have been met to a high degree, but not those of workers. The interests of labour have not been met at all in this educational boom. For this very reason the educational boom of the seventies is no longer the result of the need brought about by the scientific-technological revolution, or at least not to a greater extent, but of strengthening of monopolist capitalism, decline of petty bourgeoisie (which instead of capital is leaving children with good education as inheritance), bureaucratization of society and of Keynsian economic policy.

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[1] Data and figures from the report submitted to UNESCO by a team headed by Edgar Faure entitled "Learning to be". Accompanying estimates on the basis of the available statistical data were compiled by the author of this paper.

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[1] For more about it, consult S. Keller and R. Vahrenkamp: "Illusions of late capitalism", "Education boom and production" - Marksistička misao, No. 1, Beograd 1975, "Marxist thought", No. 1, Belgrade 1975.

[2] See: Stipe Suvar "Socijalno-Klasna odredjenost obrazovanja" - Marksizam u svetu, No. 1, Beograda 1975, Social and class definition" on education" - Marksizam u svetu "Marxism in the world", No. 1, Beograd 1975, as well as the source given in footnote 1, above.

The young generation lives for a long time in the ghetto of education, only to move later on to the ghetto of labour, never returning to education again[1]. It emerges from school well "drilled" (that is why it was able to contribute a good deal to the development of technology and productive forces), and ideologically trained to preserve the ruling social relations (therefore contributing little to the changing of society)[2]. Entering the world of labour, it is entering the world of hierarchic relations of wages and salaries in which diplomas play the decisive rôle. The fetishization of diplomas is the outward sign of the festishization of skilled labour and in a considerable measure a form of rationalization of discrimination of workers in the productive process. The myth of professional qualification based solely on diplomas, creates the conditions for a hierarchy in the productive process, a hierarchy in wages and salaries, a hierarchy in society, all without any real reference to the work performance contribution. The prevailing division of the employed according to separate qualifications which schematically divides two groups of qualifications, one group being workers, the other being white-collar employees, is outmoded with regard to the changing character of labour, constituting one of the mechanisms of the division of the working class in the conditions of highly developed and monopolist capitalism. The hierarchic relations in the labour process make it possible to control by means of diplomas the wages and salaries and the hierarchy thereof. The hierarchy of wages and salaries reflects a relationship of sharp division between mental or brain work and physical or manual work, although due to the development of technology this distinction is really disappearing.

The costs of education are rising enormously. If one is aware that in 1976 the developed countries had an average GNP of $6,200 per capita, with education expenditures amounting to 5.2 per cent of the GNP, it means that annual education cost was $320 per capita[3]. This is twice the GNP per capita in the developing countries. Bearing in mind that a large number of newly educated cadres only reinforce the reserve army of labour, that an ever later entry of the youth into the labour process amounts to a loss in the income formation and to a new cost, and in view of the fact that the benefits of education are accruing primarily to the petty bourgeoisie, the education expenditures constitute a peculiar redistribution of income at the expense of the working class[1].

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[1] For more detail see Suvar and his essay covered by footnote 2, p. 4.

[2] There is no such thing as neutrality of education. School has always been in the service of interests and forces dominating society. The State is an increasingly dominant factor in education in the contemporary world as well as in other spheres of human activity, bent exactly on keeping education under its control and not merely because of the need and social responsibility for educational policy; see the abovementioned Edgar Faure report, (p. 3).

[3] The data on GNP per capita are from the latest World Bank Report.

The scientific-technological revolution, through the logic of the development of the productive forces, required an intensive inflow of qualified and highly skilled manpower, this being the reason for the great expansion of education. Under such circumstances education assumed with justification a great role in relation to economy. However, the scientific-technological revolution has proceeded (and continues to proceed) in old productional (social) relations, the relations based on profit. Essentially a social relationship based on profit has brought the scientific-technological revolution to serve the interests of capital. Thereby the contradictions between the productive forces in the conditions of the scientific-technological revolution on the one hand, and the productive relations on the principle of profit, on the other, have tremendously intensified, thus becoming the essential source of social and economic crisis in the developed capitalist countries sparking off also partial crises; the educational crisis just being one of them.

The myth of education as the need deriving from the scientific-technological revolution was on account of that dashed to pieces by the crisis manifest in education. It is absurd that in an era of the need purportedly created by the scientific-technological revolution the interest for occupations leading to productive creative work should be declining, and that the number of those who are preparing themselves for non-productive work should be growing, which very often means bureaucratization of society[2]. The educational boom strengthens the division between mental and manual work in an era which, by means of the technological revolution, brings them closer together; it strengthens the hierarchic ladder of skills and occupations; it also strengthen the productive forces but freezes the changes of productive relations . The conflict between the productive forces and productive relations is intensifying, becoming vividly manifest in the global crises of society, on account of which the contradictions emerging in education are also intensified. The division of labour and education - that is the core of the criticism of the prevailing situation in the educational system in the advanced capitalist countries.

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1. The committee of economic advisers to the President of the USA maintain that the youth that keep away from production are the cause of an income loss of $30 billion per year. Consequently, studying constitutes an unpaid compulsory labour; see: Antonio Lettieri "Fabrika i Škola" Factory and school - Marksizam u svetu, No. 1. 1975 - Marxism in the world, No. 1, 1975.

2. In the period from 1960 to 1969 the number of sciences students in the Federal Republic of Germany declined 30 per cent, with the problem of doctors remaining unresolved and still a profession in short supply; the source mentioned in the footnote 1, p.4. To continue: "Legal professions have created a host of procedures and contracts that ensure the costs for legal services, amounting to millions of dollars more than would be necessary in a rational system. Some are perfecting fiscal laws, others are specializing in evading them", etc.; consult S. Bowles "Protivrečnosti u visokom školstvu" - Contradictions in Higher Education - Marksizam u svetu, No. 1, 1975, Marxism in the World, No. 1, 1975, and still further: "School seems to be the only industry capable of abosorbing manpower in the coming years". It is not by chance that "The project 80" envisages in 1980 a figure of 1,150 million teachers against 265,000 back in 1965. While the number of jobs in industry is becoming stable, the number of positions in education has quadrupled in 15 years". The source: cited in footnote 1, above.

Concerning the developing countries, where expansion of education has also taken place, it should be pointed out that in regard to the educational situation in those countries, it is unsatisfactory. Eloquent witnesses to that are the facts of 800 million illiterate persons in those countries, and the shortage of cadres posing an essential obstacle to their economic and social development. Most of the developing countries are characterized by the inadequacy of the educational system in regard to the conditions and needs of economic and social development of countries, which, to a considerable degree, is the result of the inherited system of education from the colonial times, when education was oriented to train civil servants. The developing countries are grappling with the low elementary working and technological culture of their adult populace, mass unemployment which affects also the youth completing their education, division of labour and education. dichotomy of general and professional education. Also in the developing countries the costs of education are rising. It is estimated that in 1976 they amounted to some 4.2 per cent of the GNP, meaning that an average GNP of $150 per capita, this amounted annually about $6.5 per capita per year, some 49 times less than in the developed countries, although quite evidently the unmet real need for education in those countries is by far greater than in the developed countries. Compared with the total domestic accumulation, expenditures on education in the developing countries amount to 50 per cent which is very high (20 per cent in the developed countries)[1]. For this reason the developing countries lag behind also in the field of education. The gap is widening between the developed countries which, having high income, very often are spending funds on education unnecessarily and irrationally, and the developing countries which because of low income have hardly any prospects of meeting their most essential educational requirements. This, then, is also becoming a factor of the widening economic and technological gap between the developed and developing countries.

In the developing countries the critical view is prevailing of their educational systems and there is growing awareness that they simply have to abandon the traditional forms of dealing with the problem of education. Most of them are conscious of the need of formulating new developmental strategies of education[2]. In the currently ongoing reforms of educational systems in the developing countries, conditions are being increasingly created for the process of linking together schools and education with production. Insistence in these reforms is on a system of education that will be based on the work and geared towards work and production. In this respect, when emphasis is placed on the link between education and work, work is perceived within a broader social meaning. It is defined in the function of "emancipation of man" (as in United Republic of Tanzania, Republic of Cuba, SFR of Yugoslavia, Democratic Republic of Algeria, etc.). In the Final Document of the Conference of Ministers of Education of the African Countries held in Lusaka in 1976, it is said inter alia that: "Work is the essential component of development and the African of tomorrow must be a worker i.e. a producer. The imported school has devalued this attitude, but the new school has to revalue it. Integration of manual labour into education assumes a pedagogical value. Pupils learn through production work to become producers, and the social community must be involved in the production efforts"[1]. It is on such a platform in great many of the developing countries that major reforms of educational systems are underway. Common to all these reforms is the orientation of education towards work and polytechnical knowledge.

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[1] Calculations done by the author on the basis of the World Bank data.

[2] See : Bezdanov Stevan "Assistance and co-operation among non-aligned and other developing countries in the reform and adjustment of national educational policy to the requirements of social and economic development". The Developing Countries Institute, Zagreb 1975, and the same author: "Technological culture and merging the process of learning and production work in the system of education and in leisure time in the developing countries"; International Conference named "Technological culture in the system of education and leisure time in the developing countries", Dubrovnik, October 1978.

In socialist countries a considerable number of problems exist in the educational systems as already pointed out. Education in those countries is highly developed, the young generation being to a high degree covered by it. However, not even the educational systems in socialist countries are immune to the contradictions prevailing in the educational systems of other countries. Here too the socio-economic division of education and labour is in evidence (although an enviable didactical-pedagogical fusion has been achieved), as well as the division in the education for occupations in the spheres of mental and physical work. The hierarchy of diplomas is a characteristic also in these countries, as well as the constant desire of prolongation of education, and great rise in the costs of education, etc. For this reason unacceptable is the view that education in socialist countries is immune to those problems arising in education in developed capitalist countries.

Even such a rough cross-section of the problems arising in the current educational systems shows that the crisis of the system of education is present in all countries; that the manifesting forms are similar but that the causes of such a state of affairs are different. The central contradictions in the present-day system of education derive from the fact of its separation from the labour process, as a historical consequence of the evolution of socio-economic relations. The separateness of the process of education and labour leads to an economically and socially irrational system of education, to economic losses and human frustrations, to the widening of the gap between mental and physical work, to a growing hierarchy of professions and occupations based on diplomas, to an irrational employment outside the production process and to bureaucratization of society, etc. This is all a peculiar manifestation of global crisis-situations of the social system based on profit. Therefore the crisis of education is present (with different specific features) in all countries. However, in the international plane it is being reflected in a growing variance between every other wasteful education in the most advanced capitalist countries and such a low level of education in the developing countries which is below any economic and social minimum. If the ratio between the costs of education in the developed and developing countries is 1: 50, if the developed countries spend on education per person twice the GNP per capita of the developing countries, if the costs of education in the developing countries amount to one half of the domestic accumulation, and in spite of which those countries are unable to develop their educational systems to meet their most minimal needs, it becomes clear in the case of education how much the problem of the gap between the developed and developing countries is the central issue of the contemporary world. For this reason, education, beside being as much the concern of each country, with its own peculiarities, is equally a world concern, because it is the common characteristic of all countries. It is equally an international issue, for it is evidently necessary to change the general environment of international relations, particularly in the field of economic relations, as a precondition for reducing the economic, technological and educational gap between the developed and developing countries.

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[1] The idea of linking the work process and education is very old. In Yugoslavia, for instance, these ideas had been elaborated in the works of our prominent revolutionaries and workers' tribunes some hundred years ago. These ideas of integrating the process of education with the work process were analysed in great detail by Svetozar Marković as early as more than a hundred years back.

SECTION II

The problems in educational systems were brought to a head in the late seventies. Everything indicated so far, points to the far-reaching implications and complexity of the outstanding issues in educational systems. Solution of these problems will be burdening quite a number of years ahead of us. It is quite obvious that the years before us, i.e., the decade of the eighties, will be more complex and more difficult than the past two decades. Even if the interantional circumstances were to be very favourable for the solution of the accumulated political-economic issues of the contemporary world, it will take a long time, more than a decade, to accomplish it. This conclusion goes for education too, because the solution of many issues that have been accumulated in education is to the greatest measure dependent on the general economic and socio-political changes in the world.

The general economic preconditions for a more balanced development in the world, especially for the reduction of the gap between the developed and developing countries, are poor for the time being. Instead of the proclaimed reduction of this gap, it is markedly expanding. Some 100 years ago the per capita income ratio between the developed and developing countries was 6:1, in the fifties of this century it was 18:1, in order to be raised in the mid-seventies to 40:1[1]. For the past 16 years (1960-1976) the developing countries have increased their per capita GNP for 20 dollars (slightly more than 1 dollar per year), medium-developed countries for $275 (or 17 dollars per year), and the highly advanced countries for $2,580 (or 161 dollars per year, i.e. more than the total per capita GNP in the low-income countries). The countries with central economic planning have increased their per capita GNP for $970 (or for 60 dollars per year). The rate of growth in the lowest-income countries (i.e. for 31 per cent of the total world population), amounted in the 1960-1976 period 0.9 per cent per capita per year, and 3.4 per cent in the developed countries per year. Armament spending for this year will be fantastic and amount to $420 billion which is 21 times more than the development assistance to the developing countries. Scientific research for military purposes consumes annually 50 per cent more than the amount of assistance to the developing countries. Poverty, dramatic disproportions in the developmental levels, the differences in the current interests, the crumbling of the world economic system as formed after World War II, the complete disharmony between the achieved political sovereignty of the countries liberated from under colonialism and their economic underdevelopment and dependence are all the causes of so dramatic proportions that constantly keep the world on the brink of an armed conflict.

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[1] Source: Research done by the author.

War, in fact, is ever-present. It is estimated that since 1945, 133 wars have been fought in the world involving 80 countries and 25 million people killed. It is necessary to mention these things again, although they are generally known. For, when we consider the problems of further development of education it has to be noted that the general contradictions in the world are dramatic and that, in order to enable education to develop successfully in the forthcoming period, it is necessary to shape new international relations which would be reducing the existing contradictions and creating generally more favourable climate for education. Neither the prospects of education may be discussed on a general world plane without pointing to the general state of the world and the need to change this world through the common efforts of all countries in the interest of peace and progress.

The general characteristics of the prevailing situation in the field of education have already been described and need not be repeated. If the serious difficulties and limitations existing in the current educational systems were not to be eliminated, if the uncontrolled expansion of education in the developed countries were to continue, with the continuing lagging of education in the developing countries, education itself would be reproducing new global social contradictions and would be increasingly becoming a limiting factor of development. The world is evidently faced with the decisive task of carrying out fundamental reforms that will lead to changes in social and international relations - in international economic relations in particular - that will ensure the sovereignty and economic independence of all countries and equal conditions for development. In this context the world has to change also the educational systems, the status of education in society, as well as the status of education vis-a-vis economy.

Any scenario of the future long-term development of education must - in our view - be based first of all on qualitative changes in education itself. This denotes the effecting of fundamental changes in the educational process itself, in the attitude of education towards production and in the attitude of education to society (and of course vice versa). This is not to say that quantitative aspects are to be neglected. They continue to be very important. Concerning the developed countries, it is obviously necessary to bring the present boom under social control, while education in the developing countries should be developing more dynamically, in the quantitative sense of the word. Although, also in the forthcoming period, there will continue to exist common manifestations in the evolution of education, as well as common characteristics, positive and negative alike, it is not possible to work out for the future development of education one uniform and universal development scenario, because material and social circumstances vary essentially from country to country. It is exactly in the variety of avenues of the development of education and its emergence from the crisis-situations that the developmental practice of education will be enriched and new experience acquired for the solution of the problems faced by all countries.

The major part of mankind lives in the developing countries, i.e. in the least developed countries, for which reason exactly the main problems are to be found concentrated around the avenues of the development of education in those countries.

Illiteracy, shortage of professional cadres and even of elementary technical literacy, as well as many other already mentioned facts, speak of the underdevelopment of education in the developing countries which clearly indicates that the human factor is not satisfactorily educated as to be able to join successfully in the development with a view to securing economic and social preconditions for the ensurance of sovereignty and genuine political independence. The struggle for the new international economic order is aimed exactly at ensuring international economic conditions for the developing countries to attain economic equality and independence and, on this basis, to be able to accomplish a continuous and stable economic and social progress on account of which they would be able to rid themselves of centuries-old underdevelopment. The struggle for the new international economic order is, in fact, the struggle against the economic monopoly and hegemony, for economic and political emancipation at the developing countries. However, the new international economic order has also a broader significance than might be forthcoming from its name. Although this is a process which must be accomplished primarily in the plane of international economic relations, it is simultaneously a component part of the struggle which the non-aligned and other developing countries are waging for their economic, social, political and cultural transformation and progress. Therefore the real purpose of the new international economic order transcends the economic domain (although this domain remains most important as the basic precondition in the present development stage); it, in fact, calls for comprehensive development of every individual in the creation of any sovereign national community. And it is more than evident that education (together with science and culture) constitutes an exceptionally powerful factor of such a transformation of the developing countries and the establishment of new international relations, primarily economic, that will proceed from the sovereignty and equality of all peoples[1].

All the developing countries should have (and could have, in view of the great similarity of their conditions), some common components of the developmental strategy of education. Bearing in mind the reality of the developing countries, the aims, tasks and principles already established in the reform of the educational systems in the developing countries, as well as research done in that field, we take it that the common principles on which the scenario of the developmental strategy of education in the developing countries could be as follows:[2] 1. Foundation of the entire educational system on the principle of permanent education; 2. Equality and unity of the system of education of the youth and adults; 3. Interconnection between the process of learning and the process of work; 4. Integrated education (for work, cultural life and participation in social and state affairs);

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1. See: the mentioned works by Bezdanov, the Economic Declaration and the Programme of Action of the Fifth Conference of Heads of State or Government of Non-aligned Countries in Colombo 1976, as well as the author's own work entitled "International economic crisis and the position of Yugoslavia", published by the "Savremena administracija", Beograd 1978.
2. Consult the cited works by Bezdanov, as well as the Report by the team headed by Edgar Faure.

5. Ensurance of horizontal and vertical mobility within the educational system and groups of occupations or professions; 6. Provision for the return to the process of education from the process of work; 7. Change of the manner of education that will ensure development of critical spirit, independence and creativity on part of the people undergoing education; 8. Ensurance through social measures of democracy and equality in attitude to education; 9. Incorporation of students, educationalists as well as of representatives of all interested structures of society into decision-making on the policy of education.

We consider these to be the common starting bases acceptable to all countries, taking into account the reality of their situation and the objectives which they ought to realize through development. However, each nation has its peculiarities, none is identical with another; consequently, the differences in the field of the educational system are also significant. Therefore, proceeding from the common principles, the ways of realization and forms will differ significantly. For this reason it is necessary in every country to work out a national strategy and moreover, in many countries, in view of their internal differences (economic, cultural, etc.,) it will be necessary to even further decentralize planning and the realization of their global educational strategy.

In this context, education should provide for the formation of man as an integral personality who by his ethical, moral and professional abilities and orientation, will be able to strive for such a system of social relations within each country, that will be economically rational and at the same time socially justified. This is to say that a new human personality has to be developed and educated for a new society, a society that is being built, one that is still not in existence. This is evidently an exceptionally complex task and probably education has never in its long history been at such a crossroads and faced with so complex and major a task. Education has to incite creation of conditions in which the worker will be both professionally and spiritually equipped for work and life in order not to be only a spiritually impoverished manual participant in the production process, in fact a highly productive specialist, but spiritually retarded. Education must oppose the robotization of the process of work and creation of spiritual cripples. It is the educational process too that ought to encourage the return of the spiritual power to production, as an essential condition to stop the process of technocratization and bureaucratization.

In order that education in the developing countries could be developing in so charted directions, and to be able to play such a role in their development, corresponding material and social preconditions are indispensable in every country. These preconditions have to be created, first and foremost, through efforts exerted in every country and through self-reliance. Of course, in order for these domestic efforts to be undertaken by the developing countries, to produce results it is imperative to intensify the process of the establishment of the new international economic order so as to secure through international economic instruments, the economic equality of the developing countries, and to foster greater transfer of financial resources from the developed into the developing countries and thus to facilitate their more accelerated development.

No lesser, and in many respects a similar rôle should be played by education also in the further development of the developed countries. The process of democratization of education has to be strengthened; its rôle is not only to ensure the massiveness of education but also to eliminate intermediaries between man and education and to establish a link between the work process and education. Many of the principles suggested as the basis for the developmental strategy for education in the developing countries are valid also for the developed countries and for the resolution of the crisis-situations of education in them. However, in order to make it possible for education in those countries to undergo gradual progressive transformation and to overcome the crises, appropriate social reforms are necessary which will create the objective conditions for such a transformation of education. First and foremost, it is paramount to carry out such reforms as will expand the area of work and production, enable better use of available material and human resources. This should lead to such reforms which, with a view to expanding the possibilities of work and production, will reduce the rôle of profit as the exclusive factor determining the volume of production and consumption. And such possibilities (as well as needs) the developed countries do possess. Tremendously expanded could be the front of labour and production by means of further reforms that would lead to the reduction of social inequalities; providing better solutions to the problems of social standards (particularly housing, public amenities and utilities, health care, etc.), creating material conditions for comprehensive enrichment of the life of people, and finally, shortening the working hours. Reduction of working time has become quite a topical issue in the most advanced countries. This matter certainly falls within the framework of the developmental strategy for the next two decades and should not in the least be consigned to the realms of utopia. It is also within the boundaries of reality to expect that in the next two decades the working time in the developed countries will be reduced for about 30 per cent[1]. This would be opening the scope for the youth and unemployed to participate in the work process, without harming the standard of living of those already employed in the work process, as the possibilities for increasing the productivity of labour in the present technological conditions are substantial. This would, naturally, require investment of material means for creation of diverse activities which would be enriching the socially beneficial and humane spending of leisure time. However essential for the expansion of the scope of work and production, as the central prerequisite also for a transformation in the system of education in the highly advanced countries, are also international circumstances. Dependent on them are likewise the prospects of expanding markets, and by the same token, of expanding labout and production. The establishment of the new international order is therefore in the interest not only of the developing countries, but equally of the developed ones. By the creation of equitable economic conditions for the development of the developing countries, new and very extensive markets would be opened for the developed countries (which is exactly the essential prerequisite for the expansion of labour and production), opening likewise broader possibilities for procurement of necessary raw materials and energy. In such circumstances the senseless investment in armament could gradually be diverted to other, socially beneficial, and so dramatically necessary production. Changes make for development. Changes must be the price for the developed countries that is worth paying in order to ensure their own development which will generate new personal and social values, which, in turn, will gradually continue to develop and transform society towards its greater humanization, its economic and social progress, and greater security in general.

The scenario for the developmental strategy for education in the developed countries should be guided by those same principles expounded for the developing countries. Naturally, this would be applied in quite different circumstances of social systems, developmental levels and peculiarities of each country concerned.

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[1] Vide the relevant analyses by Kahn and Wiener.

Here, too, the fundamental changes in the system of education would have to proceed towards a life-long process of education for work and comprehensive life, for the understanding of development as a system of changes. However, not merely for understanding, but also for active and responsible share in the making of decisions on the necessary changes leading the world in the conditions of high technological development into the world of greater freedom, humaneness and security. Education in the developed countries should be promoting the awareness of the necessary social reforms, both domestically and internationally, as the prerequisite for a safer and more humane life. Actually, education should educate man for his long, and in many respects still unforeseeable future. It has to prepare him to become an active participant in the building of this new future - the one that will be founded on respect for the divergence of interests, thus creating conditions for security, peace and progress of all. On account of its content and spirit, education should be marching ahead of society. It should help society to implement with as little difficulty as possible the reforms imposed by reality in the conditions of unprecedentally expanded production forces. Society ought to facilitate the evolution of education in that direction. How much possibility is created for the development of education to move ahead of society in more respects in the shaping of a new human personality, so much more will it be able to facilitate (or limit) the finding of solutions to the critical issues of the global society.

SECTION III

The scope of such a paper as this one is too modest in regard to the complex and profound dilemmas that remain to be resolved in the sphere of education in the forthcoming long-term development. Here we have only sketched the problems and outlined out perception of directions in which the future strategy for education ought to be searching for solutions.

The rôle of UNESCO in the co-operation of countries in providing solutions to common questions in education,science and culture, has been exceptionally important. The ideas and suggestions submitted by UNESCO have always been considerably ahead of reality. Preparing the development decade for the seventies UNESCO had pointed to the crisis of education, to its causes and to the alternative ways out of it. The assessments that UNESCO had made have been accurate. However, the crisis is deeper than it could have been anticipated. The more all the countries of the world become aware of their interdependence, the more they jointly search for solutions for the future of the world, the more the rôle of UNESCO will grow. UNESCO has a great rôle to play in an open and genuine analysis and the appraisal of the situation and consequences if the current trends continue, as well as of alternatives to have the problems resolved while respecting the differences of interests and views alike. Therein the rôle of UNESCO is of world interest and irreplaceable, and it is to be believed that UNESCO will be discharging it successfully. There is no reason for pessimism. Mankind has always in the critical hour come up with the right answers securing progress and a breakthrough and will no doubt do it again at this present juncture.

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REFLECTIONS ON THE FUTURE DEVELOPMENT OF EDUCATION[1]

by B. Kluchnikov

1. Origin of the study

The General Conference of Unesco, at its 20th session has approved the project "Reflections on the future development of education" which may become one of the central themes of the Organisation for 1979-1980. This project envisages writing and publishing widely throughout the world a Unesco report on long-term prospects for the development of education in the 1980s and 1990s. For the sake of convenience the project is often called "Education for the Year 2000". The participation of prominent researchers and scholars in this seminar, organized so timely by the IIEP has provided us with an additional opportunity for early consultations concerning the aims and modalities of the study.

It would be appropriate, however, to introduce you to the history of this project. Unesco established in 1970 the International Commission for the Development of Education. This independent commission has prepared, with the help of the Secretariat, a report entitled "Learning to be" which was first published in 1972 and in the following years was translated into more than 30 languages. The report has had a considerable impact on educational policies and plans and has stimulated discussions of educational problems round the world which are still continuing. The new study will, of course, take into account the lessons of "Learning to be". But its aims are different: as a result a Unesco report on probable development of education will be prepared and submitted for discussion.

The last General Conference of Unesco has underlined once again the objective necessity of further emphasising prospective long-term educational planning and social forecasting in general. Social forecasting and even long-range planning have become very concrete and respectable activities within the United Nations system as well as for national authorities, universities, foundations and investment banks. It is noted at the same time that prospective studies of education are relatively neglected. However there is an urgent need for them because of the long-term nature of the educational process.

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[1] The views expressed in this paper are those of the author and do not necessarily represent the views or policies of Unesco.

The Director-General of Unesco, Mr. M'Bow, introducing the report of the panel of consultants concerning Unesco's contribution to the establishment of the New International Economic Order (NIEO), entitled "Moving toward change", quite clearly indicates that prospective studies should be one of the important tasks of the Organisation and a new function of the United Nations' system in general. The report states that "Unesco, which is in a very favourable position to take advantage of the experience gained by other international or national intergovernmental or non-governmental institutions and centres in their particular fields, could assist in the synthesis of what may be called the science of development - of a global or integral development".[1]

2. Outline of the study: aims and modalities

In the light of the above, Unesco is undertaking a study on future trends in the development of education in the 1980s and 1990s, which will constitute Unesco's contribution to the devising of strategies for the New International Economic Order and its participation in the United Nations' Third development decade. One of the purposes of this study will be to explore probable trends of the development of education during the two coming decades and to outline priorities for international co-operation in education. It will take into account the major trends in the development of education during the preceding decades in the various Member States and regions as well as social and economic changes in the world and foreseeable advances in science and technology. It is foreseen also to establish an inter-disciplinary Panel of eminent educators, philosophers, scientists and specialists in culture. The Panel will assist Unesco in defining the general framework and detailed plan of the report as well as the topics to be covered by special studies. Experts of the Panel will follow and advise on the progress of work and the preparation of the report, setting out the results and conclusions of the reflection on the future development of education. The Organisation also intends to involve in the study, first of all, its regional offices of education and to discuss widely the preliminary results of this study at symposia which will be organised at regional and national levels.

As to the aims of the study, the present thinking on the matter is as follows: The report to be submitted to Member States and published by Unesco should assists Governments in their efforts to formulate long-term educational policies and plans with a view to ensuring harmonious development of education. It is intended that the report shall provide a starting point for a series of studies as well as of decisions on concrete measures which will lead to continuous adjustment of educational policies, strategies and plans. The report will concentrate on the rôle of education in development, more particularly in the establishment of the New International Economic Order. It is expected that it shall also help to reconsider principles, aims, dimensions and modalities of international and regional co-operation in the field of education. In the light of a thorough examination of Unesco's past performance in the above field, the report might develop prospects for Unesco's future actions in promoting educational development and educational co-operation, particularly on Unesco's contribution to the UN Third Development Decade.

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[1] Moving toward change, Unesco, Paris, 1976 - Appendix, par. 34.

It is worthwhile to note that education is taken in its broadest sense, comprising both formal and non-formal educational activities. The study will be based on innovative approaches, emphasizing such educational concepts as life-long education, major factors affecting educational development, first of all of scientific and technological advancement, accelerated changes in informatics and new educational media etc. Another feature of the study is that education will be analysed in the light of the development process in the extremely heterogenous states of the world. The point of departure is the concept of development which places man at the centre of development.

Among the main tasks of the study we may envisage a critical review of the major educational concepts as well as a critical review of main trends observed in the previous decades, lessons of major educational reforms and innovations and the crises which have shaken a number of educational systems. It is expected that the study will identify existing and foreseeable major problems and trends with which the Governments will most probably be confronted in the near future.

At present we do not think that the report should be normative and that it should embark on constructing various models of educational development, nor should it probably concentrate on quantitative projections. Rather various scenarios of educational development and educational policy trends should be placed at the centre of the study.

However, the report itself may attempt to define criteria and advise on approaches for the Governments to formulate long-term educational policies and plans of educational development. Naturally such approaches and methodologies should give due regard to the diversity of existing regional and national situations and structures as well as to the changes most likely to take place in the course of the coming years. The study may formulate recommendations concerning international co-operation which will embrace its principles, its intellectual and material dimensions.

3. Methods of work

Another issue to be clarified as soon as possible refers to the methods of work. What should be the matrix of competences involved in the study ? What should be the techniques of forecasting : highly technical approaches (Delphi techniques, cross impact analyses, relevance trees, scenario building) or identification of trends on the basis of empirical evidence, historical analogy and extrapolation ? We are attempting to single out and synthesize relevant experience around the world. The preparation of the report will include three major stages : (a) working out relevant themes; (b) obtaining documents; (c) analysing and synthesizing their content.

The first task of determining the themes or topics around which information is to be gathered, seems to be of particular importance. We think that the themes of common interest to the Member States should be carefully identified and selected, so that together they provide a coherent frame of major contemporary and future problems of educational development. Each of the themes will represent a field of enquiry and the useful types of documentation should probably vary from theme to theme. We think that information should be gathered in various parts of the world with a view to being representative of educational policies of different states. Special precautions will be taken to avoid unbalanced concentration on developed countries known for having reached a relatively advanced stage in prospective studies and in long-range planning.

The Panel will advise on the selection of major themes to be analyzed in the Report. The Secretariat intends to elaborate for each of these themes a trend report which will regularly incorporate new material and update the old, so that each time they will be a bit better than the previous ones.

The trend reports may be submitted one by one to the meetings of the Panel for critical appraisal. The themes identified by the Panel will be the basis for trend reports elaborated by the Secretariat into chapters of the report. The report should give a fairly coherent and comprehensive picture of the prospective educational development.

As to the type of documentation to be analyzed, it seems to be appropriate to give priority to the governmental long-term educational policy statements, plans and outlines of educational reforms, to prospective studies of international organisations, first of all of the United Nations and its specialized agencies. To this effect the Secretariat of Unesco has sent in June 1977 to all Member States a request to provide us with documentation related to educational policies and plans, including targets of overall economic development plans. For the time being we have at our disposal some 100 educational development plans. The number of long-term plans is very limited. It is expected that due attention will be given to futurological studies of some research institutes and of eminent scholars. The themes of the study should group around not only purely educational issues but relate also to the broad range of factors which will probably affect the future educational development: demography, ecology, politics, social relations and the cultural context for educational development. The study may use some broad generalized quantitative projections on population, income distribution within and between nations as well as Unesco's projections of school enrolments and financial resources for education.

4. Major themes for the reflections on the future development of education

Similarly we think it would be useful to begin already now with early consultations regarding the identification of major themes to be elaborated in the study. What should be the criteria for their selection, taking into account the comparative advantage of Unesco in this field ? The programme of the Organisation for 1979-1980 emphasizes such themes as democratization of education, education and productive work and coordinated development of formal and non-formal education. I am suggesting for critical appraisal a list of themes which might eventually be included in the study on the future of education. Needless to say this is quite a comprehensive list, out of which some 5-6 major themes should be selected.

5. Retrospective review

Major factors which in the 1950s - 1970s affected educational development. Prevailing educational concepts, educational goals and their philosophical roots. Various concepts of educational change. Considerations with regard to ends, means and effects of educational innovations and reforms. Significant changes and emerging trends in education in various types of developed countries.

Major trends in quantitative and qualitative developments in education in various newly independent nation states of Africa, Asia and Latin America. Typical and specific disfunctions of education in various societies (e.g. elitism, irrelevance, conservatism, multiplicity of educational patterns in the same country, transplanted models, inefficiencies, etc.). Discrepancies between educational policies and actual developments.

Diversity of patterns of educational development reflecting different socio-economic and cultural contexts. Comparative analyses of educational policies. Adaptations and reversals educational policies in the 1950s - 1970s. Alternative priorities and new emphasis in educational policies and plans based on analyses of official documents of Member States on educational policies and actual developments.

Evolution of Unesco's concept of educational development. Synthesis of Unesco documents adopted by the General Conference, IBE Conferences and regional education conferences ; debates and commentaries on the Unesco-sponsored report of the International Commission on Educational Development (the "Faure Report"). Lessons of the past.

6. Prospects

Prospective goals for mankind in the light of ethical imperatives, such as equity (ethical and probably other values ?).

Diversity of emerging concepts of development (in conjunction with the related project of the UN University).

Multi-dimensional character of the UN Development Strategy. Man as the centre of development. Contribution of education to the programme of action for the establishment of the New International Economic Order. Review and synthesis of major international, regional, and some national studies, long-term projections and various scenarios of development with regard to their probable implications for education.

Changing rôle and functions of education in society. Conflicting concepts of future development of educational diversity of educational goals and their probable implications for educational policies and plans: (i) the positivist/pragmatic/rationalistic approach to education as a medium of increasing economic efficiency, of human capital development; (ii) increasing emphasis on education for social responsibility, intellectual excellence and spiritual perfection, the challenge of degradation and devalorization of the personality; (iii) education as a process of social reconstruction: fashioning a better world, better working environment and higher skills, correcting natural inequalities, expanding people's aspirations and responsibilities. Education for understanding the meaning and goals of human existence, the relationship between man and nature, the ethics of progress.

Relationship between education and culture. Education for nation-building and cultural identity. The concept of endogeneity of educational development and the objective necessity for creation of modern societies. The dualism of education: the national and universal character. Education for international understanding and solidarity.

7. Scenarios of probable educational development in different historico-cultural types of society in the context of economic, social and political variables

- Outward dimensions of future development of education

Analyses and implications of factors which will most likely affect the future development of education: challenge of accelerated change; probable image of scientific and technological advancement in different types of countries; economic growth prospects and ecological limitations; demographic growth; urbanization trends. Social disparities within and between nations; probable new criteria for social stratification and prospects with regard to differences among social classes. Probable trends in international exchange; labour migration; changing relationship between education and employment, between work and leisure time; explosion of knowledge and development of informatics; changes in work ethics; youth and women's educational aspirations; forecasting probable future demand for education.

Broadening of the concept of education. Probable developments in lifelong learning. Formal and non-formal components of education and practical implications for future educational policies and plans.

Education and social equity. Multi-dimensional character of democratization of education. Prospects for democratization of education in various types of societies.

Considerations with regard to projections of resources for educational development. Changing criteria for rationality of their use.

Reflexions about the future of literacy: quantitative and qualitative forecasts. Prospects for development of other ways of access to knowledge.

Probable evolution of interactions between education, productive work and employment. Employment/unemployment/prospects. Co-ordination of educational and manpower policies.

Probable educational implications of continuing rapid urbanization.

New approaches to education in rural areas. Educational component of community development schemes (theme related to the World Bank study).

- Inward features of future educational development

Future of educational institutions: emerging structures, contexts and methods; prospects for schooling; institutions of higher education. Work related general education. Formal and non-formal technical and vocational education.

Prospects for non-formal education and coordination of its development with formal education.

New developments in pedagogical science and their implications on the learning process; growing rôle of family in education of children particularly in the pre-school education; changing rôle of teacher.

Use of local languages for education: pedagogical, political and economic aspects.

Education and mass communications. Prospects for new educational media: economic and educational considerations.

New challenges for educational policy-making, planning and administration. Participation aspect; planning and administration for non-formal education; the need for long-range policy planning.

Rôle of research for forecasting probable educational development. Reflexions on principles, objectives and modalities for future international and regional cooperation in the field of education. The future rôle of international organisations in the field of education; national and international views. Reflexions on Unesco's future mission in promoting educational development and cooperation. Place and rôle of prospective studies in the medium-term programmes of Unesco.

Reflexions on specific features of educational developments in different socio-cultural contexts. Prospects for standardization or further diversification and progress of education.

Your advice is needed for adding new themes, eliminating others and reformulating and rearranging their combination. In other words, the purpose of today's discussion is to find out your opinion on the orientation of the study in general and in concrete themes.

An important question which we would like to ask is what should be the "idée conductrice" of the report. For comparison - the message of the "Learning to be", for example, was: "We propose life-long education as the master concept for educational policies in the years to come for both developed and developing countries". Our preliminary consultations among colleagues indicate that among possible "poles" around which (alternatively) the report may be structured are "education for the New International Economic Order"; "education for international understanding and solidarity"; "education for harmonizing relationships between man and nature"; "interaction between formal and non-formal education"; "new goals, principles and modalities of international and regional cooperation in education".

The theme of educational goals as indicated in para. 7 of the list needs, I feel, a special explanation. There are signs that for many countries the times of quiet educational growth and of moving equilibrium are over. Parallel to the profound social transformations, changes are taking place in educational concepts and educational policies and goals. At the regional conferences of Unesco and other representative forums, it is often repeated that there is no task more important than rethinking of education. What remains common for practically all major educational concepts is the view of education as the major bridge between material culture (means of production) and spiritual culture. Its function seems to harmonize both of them and to narrow the gap between two structures.

There are several easily identifiable educational philosophies. Of course in practices of educational policy and planning they are not mutually exclusive but rather interpenetrating. However, we may clearly distinguish various emphasis.

For the time being, probably the most influential one may be termed in essence as positivist, pragmatic and rationalistic. It is a branch of the evolutionist theory, and aims at a socialization of young generations into existing social structures, at increasing economic efficiency, at "human capital" development, as well as at preparing for life in consumer societies; at the same time it draws attention to some basic needs of socially disadvantaged population groups. It implies that educational reforms and innovations should take place within the existing social context and be mostly incremental, technical innovations, without bothering too much about cultural conflicts, social tensions or moral, ethical norms.

Another philosophy of education has strong personalistic overtones and as such emphasizes such goals as the importance of learning for understanding human existence, of the relation between man and nature, of the ethics of progress. It raises the issue of the respective rôle of science and ethics in educational development. However, intellectual excellence and spiritual perfection remains its central goal. It is alarmist with regard to the degradation and devalorization of the human personality; it warns against the misuse of mass media for conditioning the human mind, against the increasing danger of standardization of human beings and the dehumanizing effect of science and technology.

Of considerable importance for further development of this concept was the Colombo conference which, in a number of its recommendations (Nos. 2, 3, 19) persistently stressed "the significance of the necessary balance between materialistic progress and moral ethical and cultural attainment". The Conference "invited Member States to undertake a study on the moral, ethical and cultural needs of their countries". By the same recommendation Unesco is invited "to undertake an in-depth study on the linkage between moral, ethical and cultural values and educational development".[1] It is worth-while noting that the plea for an ethical approach to education and to development in general comes from Asia, where the bulk of the poverty stricken population of the world is concentrated. Many delegations referring to poverty, hunger and malnutrition insisted on "the inevitable preponderance of economic considerations in orienting educational reforms."[2] Yet another philosophy emphasizes the social responsibility of education, recognizes its fundamental rôle in fashioning a spirit of community and of a better world, a better working environment and higher skills. As Mr. Ghandi taught, educating the brain by the hand, it promotes the idea of moderate consumption, of self restraint and of selfless service in the community for correcting natural inequalities. Among the major functions of education, it sees the promotion of nation-unity or nation-building and cultural authenticity. It clearly distinguished the growing danger of total distruction and disappearance of cultural values, accumulated by past generations. Cultural revitalization is one of the common features of on-going educational reforms. This dynamic philosophy is gathering momentum in countries of Africa, Asia and Latin America. The Lagos Declaration, adopted by the African Ministers of Education in 1976, states: "Education should be national and democratic, authentic and modern". The Colombo conference also referred to "education serving as a means of strengthening national unity and identity, through the inculcation of moral, ethical and cultural values in the people".[3]

The social responsibility concept is an antipod to selfishness, egoism and elitism. It attempts to counteract the growing wave of nihilism.

Of course, these philosophies do not cover the rich diversity of educational goals. There is for instance a frightening educational doctrine which promotes the principle that basic human needs and human drives can and should be changed by educational means. It implies nightmarish prospects of

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1. Final Report of the Conference of Ministers of Education of the Unesco Member States in Asia and Oceania held in Colombo, July 1978, Paris 1978, page 62.
2. *Ibid.*, page 48.
3. *Ibid.*, page 63.

reconditioning and "social engineering". The famous novel "Brave New World" by Aldous Huxley, published in 1932, was as a matter of reality an early warning against this doctrine and actual trends in educational development.

We do not exclude, of course, that the study will indicate that the diversity of educational goals in various societies may in future increase even more. It may be just a consequence of the organic growth, which presupposes a process of differentiation. Whatever the "idée conductrice" of the report and its outcome, it is clear that education should in coming decades be fundamentally rethought. This it the time when basic values and norm stratum are reconsidered as being responsible for many troubles, shocks and crises. A storm of change is gathering force with waves of ever accelerating speed and unprecedented impact. As is often said, acceleration is one of the most important and least understood of all social forces. The dangerous incapacity of education to prepare people for a rapidly changing world, requires anticipatory long-term educational policies and planning. We hope that the new Unesco study will contribute to promotion of the formulation by Member States of educational policies and plans which will permit them to meet new requirements and changes.

PART THREE

EDUCATION AND DEVELOPMENT MODELS

Documents presented at the Seminar

THE FUTURE OF EDUCATION IN RELATION TO THE NEW INTERNATIONAL ECONOMIC ORDER

by S. Encel

In 1968, Dr. Philip Coombs published a well-known analysis of the 'world crisis' in education.[1] The word 'crisis' is again appropriate, although the nature of the problem has shifted. A decade ago, people were concerned with the failure of educational provision to expand to meet the targets of the 1950s and early 1960s. It had become increasingly obvious that economic growth in the developing countries could not sustain such expansion, especially as demographic pressure was constantly raising the numbers of persons for whom provision would have to be made. In addition, optimistic assumptions about the positive rôle of education in developing countries, which characterized early plans for raising living standards, turned out to be fallacious. As Curle remarks, the actual progress of educational policy in the developing countries does not encourage optimism. In particular, over-reliance on Western models, especially of higher education, has promoted disunity and inequality and created needs and desires which are discordant with development, even in the narrow economic sense, and much more so if 'development' is construed in a broader moral and social sense. Educational policy had gone astray because of a failure to orient itself properly to the productive life of the community.[2]

In 1978, the previous crisis still exists, although it is now overlaid by rather different considerations. Education continues to be of dubious value in the developing countries, and the unsuitability of past policies is the theme of a vast and rapidly growing literature. This criticism of educational policies is a subset of a wider attack on the concept of development and the rôle of international aid programmes in contributing to it, which culminated in the demand for a New International Economic Order enunciated by the U.N. General Assembly in 1974. It is now sharpened by fundamental re-thinking about the value of education, which has become a major item on the agenda of social issues in the 'advanced' countries. The advent of rapid inflation and large-scale unemployment, combined with the prospect of major and highly disruptive technological changes, means that the prospect of continued educational expansion is at an end. Cutbacks in government spending on education are now the order of the day, and the problem of 'mismatch' between education and employment is becoming one of the central themes of educational discussion.

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[1] P.H. Coombs, The world educational crisis; a systems analysis London, Oxford U.P., 1968.

[2] Adam Curle, Educational strategy for developing societies London, Tavistock, 1963.

The concept of the New International Economic Order (NIEO) arises from one of the basic social and political motives of our time - the demand for equality, or at least the reduction of inequalities within nations and between nations. On the international plane, this means that 'development' should be construed as the reduction of inequalities between the rich and the poor nations, whether we think of them as DCs and LDCs, North and South, or the three worlds. In Curle's words, development is inconceivable without equality and justice. He defines development as the move towards a society which is marked not only by an increased level of GDP per head, but by basic social qualities including security, cultural satisfaction, and the ability of the individual to realize his or her full human stature.[1]

Until recently, it was assumed that educational expenditure would grow as a consequence of the continuing rise in GDP per head. The work of economists has pointed to a close connection between industrialization, growth rates, and the expansion of education. Edding, reviewing levels of enrolment at different stages of the educational process since the beginning of the century, suggested the operation of an 'iron law' of educational expenditure which makes it grow faster than national output, because student enrolments and teacher/pupil ratios have positive income elasticity.[2] The great speed of educational expansion between 1950 and 1970 appeared to confirm this iron law, with elasticity rising in step with ascent of the educational ladder.

It now appears that the iron law also operates in reverse. With the decline of growth rates (made even sharper in real terms because of inflation), the persistence of high levels of long-term unemployment, and widespread political resistance to the growth of welfare services (including education), there is a general tendency to cut spending on education even faster than the general downward trend of government expenditure, and the higher levels are feeling the greatest pinch. It appears that the problems of education share characteristics which transcend the differences between the advanced countries and the developing countries. Disillusionment with the economic, social and political consequences of investment in education has been marked in the developing countries for some time, but the advanced countries are rapidly catching up.

One of the major intellectual and policy failings during the era of expansion was to treat education as a kind of 'epiphenomenon' of economic growth. Typically, economists consider education as both investment and consumption. As an investment input, it was taken to contribute a large share of economic growth because of its enhancement of productivity. This argument received special attention from some leading economists in the 1950s, notably in the work of American writers like Schultz, Denison, and Machlup. In fact, the proposition that education should be treated as an investment goes back as far as Adam Smith, who ascribed the superiority of manufacturing industry in

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[1] Adam Curle, op. cit

[2] I. Svennilson, F. Edding and H. L. Elvin, Targets for education in Europe in 1970 Paris, OECD, 1962.

Scotland to the Scottish educational system. A century later, Alfred Marshall described knowledge as man's 'most powerful engine of production', and made a pioneering attempt to calculate the returns from educational investment. Marx contended, in volume 1 of Capital, that one of the failures of capitalism lay in the refusal of private employers to invest in technical training to raise industrial productivity. In the 1890s, Russian economists were already arguing that educational expenditure was correlated with productivity. Under the Soviet regime, the orthodox view (expressed in the writings of S. G. Strumilin since 1919) has been that educational expenditure is an important form of capital expenditure, and that the success of educational policy depends on its capacity to satisfy the demand for skills at all levels.[1] During the inter-war period, particular stress was laid on the growth of specialized secondary schools or technicums to produce technicians.[2]

The assumptions already described form part of established thinking about future world trends, whether embodied in global models, scenarios or normative forecasts. Global models are, in general, an extension of model-building in economics, which use standard economic inputs like investment, demographic patterns, work force statistics, availability of material resources, technological change, and factor costs. Education is usually a dependent variable in the model-building process. However, this situation is changing, and the current emphasis on 'mismatch' between education and jobs is a reflection of the change. Education is thus being credited with positive effects on the economic situation,[3] so that its structure, content and objectives are no longer taken for granted - or, at least, treated as the special and private domain of educationalists. The need to move away from thinking about education in this segregated sense is argued with particular cogency by Husen, who foresees as ever closer link between education and occupational preparation.[4]

In this paper, we are concerned with possible educational 'futures'. But this can only be done in the context of a more general consideration of current thought about the future, to which the possible rôles of education can be related. A large part of the paper will be devoted to this consideration, giving particular attention to the assumptions involved in treating education as a dependent variable. We shall speculate about the effects of these assumptions on the structure of the forecasts themselves, and whether different assumptions with different consequences are possible. We shall also examine the projected and the actual contribution of education to the progress of the developing countries, and consider what implications this has for the New International Economic Order.

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[1] C. A. Anderson and M. J. Bowman (eds.), Education and economic development London, Cass, 1966, pp. 3-10.
S. Strumilin, 'The economics of education in the USSR', International social science journal, Volume 14, No. 4, 1962
Nicholas de Witt, Educational and professional employment in the USSR, Washington D. C., National Science Foundation, 1961.

[2] Raymond Poignant, Education in the industrialized countries The Hague, Nijhoff, 1973, pp. 89-93

[3] Policy Conference on Economic Growth and Investment in Education Volume 1, Paris, OECD, 1962, p. 34.

[4] Torsten Husén, The learning society London, Methuen, 1974

The forecasting process

Forecasting and history are inextricably linked. As E. H. Carr has written, "modern man peers eagerly into the twilight out of which he has come, in the hope that its faint beams will illuminate the obscurity into which he is going".[1] Flechtheim, who coined the word 'futurology' long before it became popular, argued that the future was rooted in the past and could be made available to us by examining its likely growth out of past events.[2] Historical interpretations provide an indispensable theoretical basis for the prediction of large-scale social changes, and forecasting can approach scientific validity only by the progressive testing of propositions within the framework of an historical interpretation. Without exceptionally powerful evidence pointing to a radical break between past and future, forecasting is possible only through the projection into future time of social phenomena which can be shown to exist somewhere in the present.[3]

The English writer H. G. Wells was one of the first modern thinkers to conceive forecasting in its contemporary form, although the idea of systematic prevision of the future dates from 18th century French *philosophes* like Condorcet. In a lecture in 1902, he described forecasting as 'inductive history', which would be concerned with working out the biological, intellectual and economic consequences of the social forces unleashed by technology. By charting the possibilities of the future it could be used to provoke man into making sensible use of these possibilities. It is significant that Wells attached enormous importance to education, and his vision of the future is one where the world's problems are set to rights by a scientific elite.

Forecasting is not, and cannot be, a purely objective exercise. The future does not exist; forecasters try to invent it. In doing so presuppositions about what *ought* to happen are interwoven with assumptions about what *will* and what *can* happen. Forecasting involves notions about the causal rôles of events, things and human endeavours in generating the future. Value-free speculation about the future is intrinsically impossible, and the idea that we can somehow predict the future, as a physicist can predict the motion of a projectile before it is released, is spurious. The physicist makes his calculations on the basis of previous data and of laws, hypotheses or theories which have been subjected to processes of controlled experimental verification. The forecaster is, in effect, making inferences from non-existent data, and his methods of inference involve controversial interpretations of past events about which only partial information can ever be available.

The growth of mathematical modelling of 'world systems' represents an attempt to overcome some of these problems. These attempts have been largely unsuccessful, because the modeller still has to decide what is and what is not significant. As Clark and Cole have observed, models can be constructed which look as though the goals to be explored with the model are left open to depend on the wishes of the user. However, it is possible to choose objectives which look reasonable but are not compatible with the deterministic structure of the model. Nearly all parameters in the

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1. E. H. Carr, *What is history?* London, Macmillan, 1961
2. Ossip Flechtheim, *History and Futurology* Meisenheim-am-Glan, Otto Hain, 1966.
3. S. Encel, P. Marstrand, W. Page (eds.), *The Art of Anticipation,* London, Martin Robertson, 1975.

'causal stratum' of the model must be selected, and selection entails value jugements. The structure of the causal stratum inevitably sets constraints on choice. All models, consequently, contain a mixture of normative and deterministic elements, and their results depend very much on the posture which the modeller takes towards the world or to the issues which the model is designed to illuminate.[1]

The major alternative to modelling is the construction of scenarios, depending mostly on the identification of significant trends which are then extrapolated through time. This entails assumptions that the trends are indicative of laws of historical movement, that they are continuing long-term processes rather than short-term fluctuations, and that they are associated with one another. Historical quantitative data are collected for a parameter; a mathematical form is found for relating it to a second parameter (generally time); and a future value of the original parameter is then found by inserting future time values. The central axiom is that a simple mathematical relationship claimed to exist between two parameters in the past will hold for the period of the forecast.[2]

Scenario construction depends partly on the selection of trends, partly on theories of historical change, and partly on speculation about possible events. The most famous scenarios are those which express the results of these conjectures in fictional form. There is a continuous history of such fictions, incorporating the impact of science and technology on society, since Bacon's New Atlantis. In the present century, fictional scenarios by writers such as Wells, Huxley, Orwell, Zamyatin and Capek have exercised a powerful influence on the collective consciousness. Since the 1939-45 war, scenario writing has become a highly professional method which attempts, not to entertain (although the great fictional scenarios retain an important influence on the professional futurologist) but to affect the conduct of policy. The best known scenario writer of our day, Herman Kahn, defines scenarios as "hypothetical sequences of events constructed for the purpose of focusing attention on causal processes and decision-points." They answer two kinds of question:

(1) Precisely how might some hypothetical situation come about, step by step?

(2) What alternatives exist, for each actor, at each step, for preventing, diverting or facilitating the process?[3]

Kahn's first attempt to derive a 'surprise-free' global scenario, The Year 2000, states a basic position which he has maintained in subsequent books, although specific items have been modified in response to criticisms and to real-life 'surprises' like the oil crisis of 1973.[4] Kahn's historical theory is expressed in the ideas of a 'long-term multifold trend' and of evolutionary historical stages derived from earlier writers like Oswald Spengler. It is a picture of the world oriented very much

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1. John Clark and Sam Cole, Global simulation models London, Wiley, 1975
2. Encel et al, op. cit.
3. Herman Kahn and A. J. Wiener, The Year 2000 New York, Macmillan, 1967
4. Herman Kahn and R. Bruce-Briggs, Things to Come, N. Y., Macmillan, 1972. Herman Kahn, W. Brown and L. Martel, The Next 200 Years, N. Y., Morrow, 1976.

towards the present distribution of wealth and power. Among the 15 'canonical variations' listed by Kahn, only one envisages significant progress towards a more egalitarian world, although it assumes that the 'underdeveloped' countries will be satisfied with 'reasonable and moderate' gains. Even within this framework, there is no consideration of the disparities within nations as opposed to those between nations. Neither is there any consideration of the possibility that such internal disparities may produce strong political movements aimed at abolishing or drastically reducing the disparities. Kahn and his collaborators foresee continued economic expansion, linked with the growth of education, leisure, and material welfare. (The growth of education, and of a 'post-industrial' society in which it forms a central feature, is one of the items in the multifold trend.) In Kahn's latest version of his basic scenario, expansion continues to be the keynote. Prospects for what he calls the 'coping nations' have never been better, and by the 21st century the world's economic growth will be led by some of the currently 'developing' countries. For the 'non-coping nations', he admits, there will be problems, but in the long term they will gradually learn to cope. The book acknowledges that food and agriculture were neglected in the first version of the scenario, but argues that there are several technological strategies which can satisfy the expected demand for food. In addition, the industrial revolution will continue to spread and to cause a permanent change in the quality of human life.[1]

Forecasting may be described as a form of meta-historical speculation. As such, it is particularly susceptible to the dangers of historicism. In his classic work on the subject, Popper defined historicism as an approach to the social sciences which assumes that their principal aim is historical prediction, and that this aim is attainable by discovering rhythms, patterns, or trends that underlie historical evolution.[2] Popper is profoundly sceptical about 'theoretical history', as manifested in the work of Oswald Spengler, Toynbee, Sorokin and Kroeber, which claims to identify stages of historical development. These stages are often expressed in geometrical metaphors, like the pendulum, the spiral, the cycle, or the S-curve. In Kahn's work, the influence of Spengler's phases of cultural evolution (Faustian, Apollonian, Magian) is clearly evident; so is Sorokin's theory of early, mature, and late stages, culminating in the 'late sensate culture' of advanced capitalism. Perhaps the most important influence on the contemporary forecasting movement is that of 'technocratic historicism', which revolves around the central process of industrialization and sees all societies as proceeding through the pre-industrial, industrial and post-industrial stages. In this succession, education and knowledge play crucial parts, and we shall now examine this relationship at some length.

Industrial society and post-industrial society

The nature of 'technocratic historicism' was examined some years ago by Goldthorpe.[3] In theories of this kind, political systems and styles of industrial organization characteristic of the 'West' or the 'North' are regarded as the norm for the future development of other societies. Diverse forms of social structure will ultimately converge, and the end point will be a post-industrial society dominated by scientific and technological elites.

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[1] Herman Kahn, W. Brown and L. Martel, The Next 200 Years, N.Y., Morrow, 1976

[2] Karl Popper, The poverty of historicism London, Routledge and Kegan Paul, 1957

[3] John Goldthorpe, 'Theories of industrial society', Archives Europeennes de Sociologie, Volume 12, 1971, pp. 263-88.

Basically, technocratic historicism asserts that economic development and industrialization proceed in similar ways everywhere. Social and political institutions, structures and values are determined by technology and economics. This is expressed ironically by Schumacher: "The modern world has been shaped by its metaphysics, which has shaped its education, which in turn has brought forth its science and technology. So, without going back to metaphysics and education, we can say that the modern world has been shaped by technology".[1] This is an ironical statement because, as Schumacher emphasizes, technology is not an autonomous variable but subject to purposive choice under the guidance of values, which are derived from man's will and not from technological pressure.

Schumacher's irony was aimed at the views of economists like Clark Kerr and W. W. Rostow. According to Kerr, the characteristic form of social organization in the modern world is 'industrial society'. He begins by setting himself the task of interpreting the industrialization process and the structure of industrial relations as exemplified by the experience of various countries. His analysis of industrial society seeks to place labour-management-state relations in the context of the imperatives of industrialization, the desires of controlling elites, and the demands of a particular environment. Technology, he maintains, is the critical factor, overwhelming all others. "The world has firmly set its face towards the industrial society and there is no turning back".[2]

Kerr's belief in convergence is sustained by his concept of the 'logic' of industrialization, i. e. the industrialization process has intrinsic requirements and concomitants wherever it occurs, and whatever the form of the pre-existing society. The inherent features of modern methods of production and distribution enable predictions about the type of society which will emerge as a result of industrialization. At any one time, a given technology will become dominant, and thus give rise to similar occupational structures around the world. Occupation, instead of class, becomes the key variable in social stratification, because of the organizational exigencies surrounding the exploitation of a particular technology as the basis of the mode of production. Technology, organization, occupational structure, and education become linked together. The new technology, writes Kerr, constrains a wide range of social transformations. "There are the initiators of change in the educational and scientific estate, the techno-structure, the top levels of industry, the progressive political circles. Together they generally overpower the no-change forces that now include some workers and many small businessmen .... The more successful and more flexible face the less successful and the less flexible".[3]

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[1] E. F. Schumacher, Small is Beautiful London, Blond and Briggs, 1973, p122

[2] Clark Kerr et al, Industrialism and Industrial Man London, Heinemann, 1962, p. 42; new ed., Harmondsworth, Pelican, 1973.

[3] Clark Kerr, Marshall, Marx and Modern Times Cambridge, Cambridge U. P., 1969, p. 125

It is this emphasis on the interdependence of the dominant technology and the form of economic organization of a society, necessitating the congruence of wider social structures and in particular the occupational structure, which holds the Kerr thesis together. Technological change necessitates changes in the labour force and the kind of work performed, changes in the educational system, changes in political institutions and the bureaucratic structure. The book Industrialism and Industrial Man was first published in 1960, and despite criticism Kerr has maintained his position. In a postscript to a recent edition, he qualifies his contention that convergence will lead to a single cultural pattern, but continues to insist that industrialization is the central dynamic of society, and that it has inescapable common denominators. The limits of diversity are imposed by the requirements of industrial technology for a certain organization of labour suited to the industrial system of production and distribution, and a related need for 'internal consistency' within a given society, in order to avoid conflict, dysfunction, or breakdown.

The views expressed by Kerr are shared, explicitly or implicitly, by many influential people in Western countries. They are, at the same time, strikingly similar to the prognoses made by writers in the Soviet Union. The main difference is that whereas Western writers regard liberal democracy as the appropriate political framework for advanced industrial society, Soviet writers foresee the supersession of capitalist democracy by a communist society. This prognosis is, of course, in line with Marx's predictions about the breakdown of capitalism, but in its current form it is less concerned with breakdown and more with the failure of capitalism to harness and exploit the productive forces made available by the 'scientific-technological revolution'. The successful exploitation of this revolution will lead to a 'post-industrial society' very much like that envisaged by American futurists like Kahn and Daniel Bell. This is clear in the writings of two recent Soviet commentators, Modrzhinskaya and Kosolapov.[1.] Progress, they argue, is to be measured by the development of productive forces. This harks back to the writings of Bukharin, Preobrazhensky, Trotsky and other Bolshevik intellectuals in the 1920s. Bukharin once described four stages in the development of socialism - ideological, political, economical and technological. Once the revolution had been accomplished (the political stage) and a socialist economy established, productive forces would take charge without the earlier constraints. Thus, Modrzhinskaya writes that the pace of scientific and technological development has gained unprecedented strength, and it is difficult to imagine the speed with which man's mastery over nature will increase in the future. Kosolapov foresees that knowledge will create the scientific and technological basis for producing universal prosperity, and that social transformations will be generated by the irresistible momentum of technological change.
Progress will be limited not by scientific and technological possibilities, nor by labour and financial resources, but by the social structure, in particular the contradictions of the capitalist system, the dangers of war, and the persistence of colonialism.

Kosolapov puts particular stress on education. Society will become a creative collective engaged predominantly in mental work. By 1983, he predicts, advanced countries will spend 8-10 per cent of national income on education, and by 2020 the figure is likely to rise to 10-13 per cent.

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1. C. Freeman and M. Jahoda (eds.), World Futures - The Great Debate
London, Martin Robertson, 1978, pp 43-6

These views, which are echoed by other East European writers, bear a striking resemblance to the picture of the 'post-industrial society' associated particularly with Daniel Bell. This picture has been described by Miles as the 'historicism of affluence'.[1]

The theory of post-industrial society has several components. It involves the transition from an economy based on manufacturing industry to a 'service economy' where the bulk of the work force is employed in a wide range of non-manual occupations. Both Kahn and Bell use this argument to extend the traditional classification of industrial activity (primary, secondary, tertiary) to include quaternary and quinary sectors, both of which are concerned essentially with the production, distribution, storage and retrieval of 'information' in some form. In Bell's terms, the 'axial principle' of the post-industrial society is the 'centrality of theoretical knowledge' as the source of innovation and of policy formulation. A dominant rôle will be played by professional and technical people, armed with a new intellectual technology. Technology assessment, forecasting models, and systems analysis will replace ad hoc adaptiveness and experimentation in politics. The new scientific and technical elites will displace existing powerful groups and society will be run on the basis of rational decision-making. Education in the new skills required will be the route to power.[2]

Bell's argument (subtitled 'a venture in social forecasting') rests mainly on two kinds of data - one dealing with the work force and the other with education. The work force data reflect the attention paid by economists since the late 1950s to the growth of the 'information industry'. In 1962, Machlup published a well-known set of calculations about the rôle of 'knowledge' in the U. S. economy.[3] On the basis of a number of heroic assumptions, Machlup computed that 28 per cent of G. N. P. was attributable to the production, collection, distribution and processing of knowledge and information. This pioneering effort was the progenitor of a new branch of applied economics, and it has now become commonplace that the information industry is the largest and most rapidly growing sector of modern economies. Using more sophisticated techniques than Machlup, Porat has recently estimated that over 40 per cent of added value in the U. S. economy is generated by the information sector, and that two-thirds of all service employment (i. e. nearly one-half of all workers) is in the information industry.[4]

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[1] Ian Miles, The Poverty of Prediction London, Saxon House, 1975, pp. 8-13.

[2] Daniel Bell, The Coming of Post Industrial Society New York, Basic Books, 1973.

[3] Fritz Machlup, The Production and Distribution of Knowledge in the United States Princeton, Princeton U. P., 1962.

[4] M. U. Porat, 'Defining the Information Sector' Bulletin of the American Society for Information Science, Vol. 2. 1976

Data like these provided a powerful stimulus to the concept of the post-industrial society. Kerr was one of the first writers to emphasize the broader socio-economic implications of Machlup's work. "What the railroads did for the second half of the last century and the automobile for the first half of this century may be done for the second half of this century by the knowledge industry; that is, to serve as the focal point for national growth".[1.] It was the knowledge industry, Kerr declared, which had transformed the rôle of higher education. Universities, once classified by Flexner as 'ivory towers' or 'service stations'[2], had now become the power houses of the knowledge industry, and Kerr suggested that they should be renamed 'multiversities' to denote the change.

The expansion of education provides the other main prop for the theory of post-industrial society. Bell relates the growth of occupational specialization to the rise of higher education. In the U. S. A., the 19th century - the period of primary accumulation - educational development was concerned with the spread of universal primary schooling, and at the end of the century higher education absorbed only 4 per cent of the 18-21 age group. Secondary schooling became universal in the first quarter of the present century, and higher education expanded in step with it. By 1920, 8 per cent of the 18-21 age group were enrolled in tertiary institutions, and 16 per cent in 1940. After 1945, this growth took on an explosive character, and the proportion had risen to 50 per cent in the 1970s. Expansion was fastest at the post-graduate level, and this was matched by the growth of full-time employment in research and development and the rise of its expenditure to more than 3 per cent of GNP.

The topic of the post-industrial society has already generated a vast literature, and in this paper we can do no more than notice the fact. Before leaving it, however, two observations relating to the rôle of education are important. Firstly, the data used by Bell (and his American critics) are almost exclusively American. The history and structure of educational systems in the U. S. A. are in many ways strikingly different from those of other countries; correspondingly, the importance of the information industry is much greater in North America than in other countries. Secondly, the place allotted to education in the post-industrial society is clearly inegalitarian. Bell himself insists on the need for meritocracy, and engages in a lengthy polemic with the philosopher John Rawls, rejecting his arguments in favour of an egalitarian theory of social justice.[3.]

Technological determinism and theories of modernization

The theory of post-industrial society rests on a particular view about the relations between science, technology and society, often described as technological determinism.[4] In Bell's rather florid words,

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1. Clark Kerr, The Uses of the University Cambridge, Mass., Harvard U. P., 1963, pp. 87-8.
2. Abraham Flexner, Universities - American, British, German London, Oxford U. P., 1930.
3. John Rawls, A Theory of Justice Cambridge, Mass, Belknap Press, 1971
4. S. Encel, 'Technological determinism and social change' paper delivered to 9th World Congress of Sociology, Uppsala, August 1978.

'the roots of post-industrial society lie in the inexorable influence of science on productive methods.... The scientific estate - its ethos and its organization - is the monad that contains within itself the imago of the future society'.[1]

In its most rigorous sense, technological determinism posits that technology makes society, that it is the crucial determinant of social change, and that it has an existence and a logic independent of society. 'Understood in its strongest sense', observes a recent discussion of the theory, 'technological determinism stands or falls on two hypotheses: (i) that the technical base of a society is the fundamental condition affecting all patterns of social existence and (ii) that changes in technology are the single most important source of change in society'.[2] In practice, few social scientists take an uncompromisingly 'hard' determinist line. A common position is represented by de Jouvenel when he declares that "everybody agrees that ours is a technological society .... if we knew what was going to happen to technology we would be some way towards knowing what was going to happen to society".[3]

Related to this view of the causal rôle of technology is the conception of technological change as part of the evolutionary process, so that 'higher' or more 'sophisticated' technologies are bound to replace simpler or more 'primitive' ones. The English historian Buckle wrote more than a century ago that the progress of European civilization was marked by the increasing influence of 'mental laws' and the decreasing rôle of physical constraints. The reason for the superiority of Europe over the rest of the world lay in man's success in "taming the energies of nature, bending them to his own will, turning them aside from their ordinary course, and compelling them to minister to his happiness".[4] In our own day, this takes the form of believing that social problems can be either solved or overcome by 'technological fixes'.

The enormous expansion of physical technology in the 20th century, and the dominant rôle which it plays in so many areas of social life, has encouraged the assumption that it can be brought to bear directly on social questions. Technological determinism has a special appeal to physical scientists, engineers, politicians, planners, and businessmen, many of whom appear to subscribe to a 'hard' version, but its influence on social scientists is considerable, especially those concerned with theories about 'modernization' in the Third World. Dickson[5] notes that the level of technology

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1. Daniel Bell, op. cit., p. 378
2. Langdon Winner, Autonomous Technology, Cambridge, Mass, M. I. T. Press, 1977, pp 75-6.
3. Bertrand de Jouvenel 'Notes on Social Forecasting', in Michael Young (ed), Forecasting and the Social Sciences London, Heinemann, 1968, p128
4. H. T. Buckle, Introduction to the History of Civilization in England, Routledge, n. d., p. 88.
5. David Dickson, Alternative Technology London, Fontana, 1974, p. 44

is the most common index of 'development' used in the literature. Technology, once adopted is bound to diffuse, and its introduction will radically change cultures in much the same way, whatever their original character. All definitions of modernization rely to a large extent on the replacement of traditional methods of production by industrial methods. Most development programmes have rested on the assumption that the implementation of Western forms of scientific and technological organization will lead to local economic and social progress. Modernization means the growth of large-scale economic enterprises involving a high degree of technical specialization; an educational system which caters for such specialization; an urbanized and mobile work force; universal literacy; rapid transportation; mass communication; and increasing levels of material consumption corresponding to the progress of economic expansion.

Orthodox development theory treats industrialization as the fundamental requirement for solving the problems of the 'Third World' initiated by diffusion of capital, plant, technology and skills from the 'advanced' countries, a gradual process of differentiation takes place in which pre-industrial social structures are replaced by, or adapted to, the imperatives of industrial growth. When this process has gone far enough, the stage of 'take-off' into sustained economic growth has been reached. Once this is well under way, the gap between originally divergent social structures becomes gradually narrower until it is confined to a residual category called 'culture' or 'tradition'.

Education and social change

As we remarked earlier in this paper, prognoses about the future are rooted in interpretations of the past. The recent past, which is accessible to us through personal experience, has the most direct bearing, but it is then used as a lens to focus on the more distant past and to extract what French forecasters call 'tendances lourdes' and 'faits porteurs d'avenir' which can be applied to the writing of future history. The recent history of education is one of dramatic and accelerating expansion, making it one of the major industries of all advanced countries. It has become commonplace to regard this growth as part of the wider process of economic expansion and social change which provides the framework for most speculation about the future. In examining this framework, we have endeavoured to point out at every convenient opportunity how the growth of education has been accommodated within it. Briefly, education expands because of economic demand for various types of labour and accordingly attracts investment expenditure; it also expands because the rise in living standards generates a large growth of welfare, including education, which correspondingly attracts a rising level of consumption expenditure. Both trends are 'progressive', in the sense that more education produces a better work force, and also in the same sense that a better-educated citizenry will lead fuller and richer lives.

These views are still orthodox, partly because they contain a large core of truth, partly because they reflect political realities. Governments, especially in the advanced countries, maintain themselves because they promise to maintain or to restore economic growth and the continued expansion of welfare. The economic troubles of the 1970s have in no way reversed these expectations; what they have produced is an upsurge of political instability due to the failure of governments to fulfil them, and the corresponding disillusionment of the voting public with the ability of government to cope.

Nevertheless, one only needs to state the propositions contained in the preceeding paragraph to recognize that all of them are highly debatable and that many people, above all among those professionally concerned with education, have serious reservations about some or all of them. There are two major facets of this dissatisfaction. The first arises from the awareness that an 'economistic' theory of education is a gross over-simplification, and that education has always played a much more complex part in society than this kind of theory allows for. Secondly, there is the feeling that his over-simplified view has been imposed on the developing countries as part of a misconceived theory of modernization, and that educational policy in many Third World countries has been either ineffectual or counterproductive. One remembers the reproachful words of Caliban to Prospero in The Tempest:

> "You taught me language, and my profit on't,
> Is, I know how to curse".

The New International Economic Order (NIEO) is at base a demand for equality among nations, so that the Third World can escape from poverty, illiteracy and hunger. It is pertinent to notice that the actual course of economic growth since 1945 has, if anything, widened the gap between nations, and nowhere more so than in the case of education. According to World Bank figures, income per head in 1970 varied by a ratio of 13 between the upper decile of rich countries and the lowest decile of poor countries. This may be compared with the ranking of countries on the score of educational development, as attempted by Harbison and Myers.[1.] Using enrolments as their basis, they divided countries into four groups ranging from advanced to underdeveloped. Out of 75 countries examined, 16 were in the advanced group, and only one of these was a Third World country, namely Argentina. In the advanced group, the index varied from 77. 1 - 261. 3; in the underdeveloped group, from 0. 3 to 7. 5. Whatever the crudities of this attempt at ranking, it suggests that the educational gradient is even steeper than the income gradient. This is confirmed by UNESCO figures for illiteracy, which showed that although the rate had fallen throughout the world during the 1960s, the gradient was still enormously steep. The rates for North America (1. 5 per cent) and Europe (3. 6 per cent) compared with Africa (73. 7 per cent) and Asia (46. 8 per cent).[2.]

These figures underscore the intensity of the demand for equality which is at the heart of the NIEO proposals. Much of the current literature on the restructuring of education may be seen as an argument in favour of enabling education to fulfil the rôle which it is supposed to play in the traditional orthodoxy, instead of being dragged along at the chariot wheels of indiscriminate economic growth, military expansion and political expediency. In this way, education can make its own contribution to economic and social betterment. The obstacles to the realization of this objective are formidable, not least because of the multiple and sometimes conflicting social rôles performed by education. We may now look briefly at some of these issues.

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1. F. Harbison and C. A. Myers, Education, manpower and economic growth New York, McGraw-Hill, 1964.
2. International Bureau of Education, Educational Trends in 1970 Paris, UNESCO, 1970.

It is clear from the foregoing data that although international inequalities in education are related to economic inequalities, the relationship is not close, certainly not close enough to be relied on a basis for policy. The looseness of the relatiomship was shown in a well-known paper by Svennilson, Edding, and Elvin in 1961. Among the OECD countries, they noted that those with the highest GNP per head (USA, Canada, Sweden) also had the highest enrolment rates; at the opposite end of the scale, those with the lowest GNP per head had the lowest enrolment ratios (Greece, Portugal, Spain, Turkey, Yugoslavia). In the middle range, however, there were wide disparities between countries.[1] Expansion since then has also loosened the relationships at the top of the scale. Norway, Denmark, and the Netherlands, all of which have lower figures for GDP per head than the United States, have in recent years spent more on education. For 1973, the respective figures were Netherlands (7.8 per cent), Norway (7.8), Denmark (7._), USA (6.7). The most striking discrepancy is between the USA and the UK. In 1975, GDP per head was $7,910 for the US and $3,910 for the UK, but educational expenditure was very similar (6.7 per cent in 1973 for the US, 6.3 per cent for the United Kingdom).

Similar conclusions are drawn in a study by Bowman and Anderson.[2.] Using a geographical breakdown, they showed that the relation between education and income was highly diverse as between regions. They used literacy rates, school enrolments, and newspaper circulation as indices of educational development, and found that correlation with national incomes was low. They conclude that although there are positive correlations between education and income, the connections are loose ones. Primary education was found to be the best predictor of economic prosperity, but post-primary education did not bear much relationship to the distribution of skills in the labour force. They drew three major conclusions : First, that economic gains associated with the growth of literacy are genuine, but they level off rapidly once a certain level has been reached. For developing countries, the implication seems to be that post-primary education should proceed slowly by comparison with the spread of primary schooling and that there is a threshold effect involved. However, there is no uniform pattern of thresholds which applies to the great majority of countries. Secondly, although an educated elite appears to be a necessary condition of sustained economic development, it is not a sufficient one. The growth of an educated elite may lead to demands for special privileges which are incompatible with economic advancement. Thirdly, the growth of education may encourage stratification which inhibits the effective economic utilization of any given level of schooling.

One of the concluding comments made by Bowman and Anderson is worth quoting at length. Economic development, they remark, involves structural transformations of a fundamental and sweeping character. "This transformation, or series of transformations, entails conflict and requires

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1. I. Svennilson et al, op. cit.
2. M.J. Bowman and C.A. Anderson, 'Concerning the Role of Education in Development', in Clifford Geertz (ed.) Old Societies and New States, N.Y., Free Press, 1963.

major adaptations and adjustments by the individuals and groups who make up a society. It both contributes to and depends upon human resource development of many kinds, including 'education' outside schools. This means that a framework adequate for analysis of the rôle of education in economic development must define education broadly, distinguish among its components and interrelations, and encompass consideration of multi-directional processes in the interplay between educational and other economic factors".

Many of the problems of educational policy in the developing countries were foreseen in the work of W. Arthur Lewis in the 1950s and early 1960s. Lewis warns against applying criteria derived from the experience of the rich countries. In the latter, he observes, econometricians have devised measures of the economic yield to be derived from education, claiming to show that the yield of investment in human beings exceeds the yield of investment in physical resources. This is fallacious, Lewis continues, because investment in human beings cannot be equated with investment in institutions of formal education. Human capacity is improved by a variety of other factors as well as education. In the second place, the example of rich countries is misleading because they have a greater capacity to absorb educated persons. "Even if we could isolate the average yield of various types of education in rich countries, this would throw no light on the marginal yield of similar types in poor .... countries".[1]

The main limitation on absorption of educated persons into the economies of poor countries is their high price relative to national income per head. Consequently, "all production or provision of services which depends on using educated people is much more expensive, in relation to national income, in poor than in rich countries. The poor countries may need the educated more than the rich, but they can even less afford to pay for or absorb large numbers". He estimated that in Nigeria, for example, it would take almost 1 per cent of national income to provide a grammar school type of secondary education for 5 per cent of the age group.

On the positive side, Lewis advanced a gradual approach to the goal of universal literacy, and argued that a more thorough primary schooling for fewer pupils would be preferable, though he recognized the political difficulties of such an approach. He also stressed the need for educating adults rather than children, pointing out that the quickest way to increase productivity would be to train the adults who were already on the job. Finally, he argued strongly against introducing the European pattern of university education into the developing countries. Instead of this, special attention should be paid to the training of people at the 'sub-professional' level, whose skills would be more directly relevant to the needs and to the resources of developing countries. As we shall see in the concluding section of this paper, many recent discussions of the subject take a similar line to the propositions put forward by Lewis nearly 20 years ago.

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1. W. Arthur Lewis, 'Priorities for Educational Expansion' in OECD, The Challenge of Aid to Newly Developing Countries, Washington D.C., 1962.

As we have previously remarked, the reasons for dissatisfaction with the rôle of education in developing countries now resonate closely with the dissatisfaction which is being voiced in the rich, advanced countries. This is an interesting example of intellectual reverberation. Originally, the argument in favour of pushing ahead with education in developing countries was that it had been shown to contribute to economic and social progress in the advanced countries. Disillusionment with the results of educational policies in the developing countries has now struck echoes in the advanced countries, as may be seen in the popularity of educational theorists like Ivan Illich and Paulo Freire. In his recent analysis of the difficulties facing contemporary capitalist economies, Hirsch comes close to the Illich position in relation to education. In conformity with his general argument, which distinguishes 'material' from 'positional' goods, Hirsch attributes two rôles to education. One he describes as the 'factory' function, i.e. the supply of skills needed by a modern economy and social system. The other is the 'filter' function, which involves the selection of the limited number of people who can fill those jobs for which prolonged education and training are required. The filter function is essential, he maintains, because without it the returns from investment in higher education would be greatly reduced, perhaps by as much as one-half. In an affluent society, as more and more people strive for the 'positional' values embodied in higher education, filtering absorbs more and more resources. Hence, the real costs of education rise and it contributes to the inflationary tendencies in the contemporary mixed economy. The social returns of education, he maintains, have become less and less important, but it has become an important area of private investment because it raises the individual's income above the level attainable by persons without education.[1]

The last point is debatable in view of the evidence produced by Jencks and others in the U.S.A. about the relatively small effect of education on income, but whatever the truth of the matter, there is little doubt that Hirsch's view is widely held and that it is a major factor in the upward trend of educational expenditure in the 30 years following 1945. As Hirsch himself notes, there are few areas of public policy where governments have moved so rapidly or so vigorously as in the case of education.

Similar conclusions are reached by Dore[2], although from a different starting point. In the first place, he looks critically at the conventional wisdom about the relations between education and industrialization. Like other historians, he notes that literacy was already substantial in a number of countries before the Industrial Revolution, and that the rapid expansion of formal education did not take place as a straightforward response to industrial development. In England, for example, one of the first effects of industrialization was to make the educational system more class-bound,

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1. Fred Hirsch, Social Limits to Growth, London, Routledge and Kegan Paul 1977 pp. 44-51.
2. Ronald Dore, The Diploma Disease, London Allen and Unwin, 1976.

well before the adoption of universal literacy as a goal. The economic significance of education entered into public policy only at a fairly late stage, and always had to contend with other forces which were concerned to use education as a means of buttressing the class structure. It was only gradually that public authorities took over the definition and enforcement of standards of entry into occupations, and that institutions of formal education took over the functions previously performed by occupational groups through their own organizations. For a long time, also, occupations were mainly hereditary, and even now there is considerable stability between generations.

Although the expansion of education has opened up more opportunities, educational institutions have also maintained their rôle of transmitting hereditary social status. As Halsey remarks, selective educational institutions are 'vehicles for the preservation, transmission, and renewal of the styles of life, lines of communication, intermarriage and social freemasonry of elevated strata'.[1] Education, he remarks, has not only enabled the gifted children of the masses to enter the upper classes (one of its traditional, though minor, functions); more importantly, it has contributed to the greater differentiation and specialization of elite groups. The older-established elites have, in general, maintained their position by a process of accommodation with the newer ones whose power is of a 'meritocratic' character. Educational expansion does not remove the social basis of selection for higher education, although it eases the strains. Although the idea of equal opportunity has become firmly rooted both within nations and between nations, the strength of social forces from both outside and inside the educational system is sufficient to ensure a high level of stability in the relative educational status of parents and children. The background of an individual in family, neighbourhood, ethnic group and social class remains as important as the school in determining educational achievement. Differences in 'educability' take the place of traditional forms of selection based on wealth or inherited social position, but the social distribution of educability is similar to the distribution of the more traditional forms of differentiation.

The importance of higher education in the formation of elite groups is, of course, a phenomenon of long standing, which might be taken for granted except that stress on the economic rôle of education has tended to blur its political rôle. Until the 19th century, this was almost the only social rôle of higher education. The very idea of competitive examinations, which seem to have originated under the Chou dynasty in China about 1100 B.C., arose as a means of selecting higher officials. Much later, European states picked up the Chinese example and applied it to the construction of their own administrative systems, starting with 17th century Prussia. One of the lasting acts of the French revolutionary government in the 1970s was to establish the system of grandes ecoles, which was explicitly intended to produce a new governing class to replace the nobility and the clergy. The grandes ecoles have continued to produce the French administrative elite, and despite massive changes in French society and the French educational system they have largely retained their functions and status. If anything, their influence has grown in step with the industrial development of France since 1945, especially because of the widespread tendency towards 'pantouflage', i.e. lateral movement out of government service into directing positions in the private sector.

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[1] A. H. Halsey, 'The sociology of Education', in N. Smelser (ed) Sociology N.Y., Wiley, 1967, p.419.

In Britain, also, the reform of the civil service in the 19th century is closely related to changes in the educational system. The reform of Oxford and Cambridge in the 1850s, which helped to drag them out of the Middle Ages into the modern world, provided the educational basis for the competitive examination system inaugurated in 1870. Ever since, the great majority of candidates for the 'administrative class' of the British civil service have been graduates of the two ancient universities.

This particular rôle of higher education has had far-reaching effects in the developing countries. Halsey's description of the process puts it very clearly:

> 'The rôle of education in the formation of new elites in the new or underdeveloped countries is especially dramatic. Not only is education a force that separates the new rich and powerful from an illiterate mass, but the modernizing elite is heavily recruited from those with educational experience in European and American schools and universities. Consequently, the problems that all new nations face in establishing acceptable forms of government are exacerbated by wide cultural differences between the people in power and their supporters in popular political movements. Correspondingly, within the elite groups, there is an enormous emphasis on the importance of education; and there is considerable tension between a desire, on the one hand, to incorporate elements of the traditional culture in the educational systems of these countries and, on the other hand, the concern of governments to emulate and incorporate the scientific and technological culture of the Western countries as a means to modernization.'[1]

The conflict of objectives described by Halsey is translated into educational planning in developing countries, as pointed out by Rowley in an IIEP study a few years ago.[2] Formal education, he notes, which is an important agency of political mobilization, may be perverted so as to achieve little else. History, language, and inter-group relations will be presented in forms of political objectives. Because of this political rôle, there will be competition between regions, interest groups, ethnic groups and political parties, the effects of which are likely to be disruptive. Most developing countries cannot afford elite institutions of higher education, and they cannot compete in the world academic market, so that the development of higher education is always threatened by a brain drain, especially if intellectually gifted persons have to go abroad to obtain advanced qualifications. The training of the administrative elite presents special problems because, for a mixture of historical, social and educational reasons, it tends to be drawn disproportionately from particular regions, social or ethnic groups. This has led to unfortunate results, including violence, in some developing countries. Rowley also suggests that it is due to the uncritical adoption of Western models of administration and the continuation of structures derived from the colonial period.

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[1] A. H. Halsey, op. cit. p. 420

[2] C. D. Rowley, The Politics of Educational Planning in Developing Countries, Paris, UNESCO, 1971, No. 15 in the IIEP series, Fundamentals of educational planning.

Rowley, like many others, also regards the educational planner as a person who is too much influenced by Western (or Northern) ideas about the proper form and content of educational systems. Basically, he contends, there has to be a choice between a 'community' stream of education with vocational objectives, informal in structure, closely geared to the local community and aimed at adults as well as children, and an 'academic' stream which is centralized, formalized, and aimed at the national or international stages.

Education and the objectives of the NIEO

The growth of the movement for a new international economic order signalizes an increasingly resolute attempt to supersede Western models of development and replace them by national and international strategies which will achieve genuine redistribution between rich and poor countries. The need for an alternative intellectual approach is put forcibly by Haq, who castigates the developing countries for being 'poor in thought' as well as 'poor in income'. Intellectual liberation and intellectual self-reliance, he maintains, are the pre-requisites for structural change, and the ideas behind the NIEO must spread to all institutions of learning and be incorporated in the policies put forward at international meetings. [1.]

The U. N. General Assembly resolution of May 1, 1974, declared that the objectives of the NIEO were to 'correct inequalities and redress existing injustices and ensure steadily accelerating economic development, peace and justice for present and future generations'. Later meetings have affirmed the need for a new worldwide division of labour. The rich countries, in taking measures to restructure their own economies, should link these with more equitable trade policies and more generous programmes of technical assistance. The developing countries, for their part, must find the capital to train a skilled labour force and to obtain the technical information which would enable them, collectively, to raise their share of world industrial output to 25 per cent by the end of the century.

In principle, such objectives have an educational dimension, which entails a drastic revision of the orthodox assumptions about the relationship between economic development and education discussed in earlier sections of this paper. It is striking, therefore, that education has not yet been the subject of an international conference comparable with those on food, population, trade and development, employment, habitat and the law of the sea which have been held since 1974. It may be presumed that education will figure at the U. N. conference on science and technology for development to be held in 1979, but it is likely to be a very junior partner in that enterprise, as it has been in discussions about the NIEO to date. One exception may be found in the views of Khadija Haq, expressed at a

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1. Mahbub ul Haq, In New Internationalist, No. 32, 1975.

conference in 1976.[1] She argued that self-reliance should be the main objective of the NIEO. The developing countries should concentrate on relevant and inexpensive services, which included redesigning those that already existed to meet the real needs of the poor. This would mean special attention to the provision of scientific and technical information, so that it was accessible to all. She suggested an international system of interchange within the Third World, and the development of centres of excellence which would maintain close links. Education, land reform, and workers' participation were three areas where basic reform was needed.

Another exception, of a somewhat different character, is the proposal to control the brain drain, or rather to exploit it for the benefit of the poor countries from which the drain comes. The original idea was that professionally trained persons who emigrated should pay a supplementary income tax, collected in the host country and returned to the country of origin. A modified version provides for the tax to be collected by the country of origin so long as the person remained a citizen, and perhaps for some internationally agreed period thereafter. Double taxation would be avoided by agreement between the countries concerned.[2] It was estimated that, in 1976, the amount involved could reach $500 million, which makes the proposal of genuine economic significance. It was opposed by two well-known development economists, Harry Johnson and Charles Kindleberger. Johnson attacked it vigorously as an extension of state tyranny over the individual. Kindleberger merely commented that it would not work, pointing out that when Pakistan imposed a tax on emigrants, the result was a sharp decline in homeward remittances from Pakistanis working overseas.[3]

Advocacy of the NIEO is tinged with protectionism and restrictive policies, reflecting the attempt to defend the economies of the developing countries against exploitation by, or dependence upon, the rich countries. Much of the criticism of the NIEO has consequently come from Western economists who (like Harry Johnson) are sympathetic to free trade and sceptical about the ability of governments to pursue rational economic policies. These arguments are closely related to the differences between the various models of the future which have been published in the last 10 years. The 'Group of 77' which supports the NIEO stands for rapid industrialization, improvement of the terms of trade, greater access to the markets of the rich countries, and the regulation of commodity prices. This position is basically similar to the models of the future put forward by those groups who regard the relief of world poverty as their major objective, e. g. the Bariloche group in Latin America, or the Tinbergen group in their report to the Club of Rome. On the other hand, most of the extant models are extrapolative in character, which means that they assume the existing structure of international relations will continue, albeit with modifications.

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[1] Khadija Haq (ed.), Equality of opportunity within and among nations N. Y., Praeger, 1977.

[2] K. Hamada, 'Taxing the Brain Drain', in J. N. Bhagwati (ed.) The New International Economic Order Cambridge, Mass., M. I. T. Press, 1977.

[3] J. N. Bhagwati, Harry Johnson and Charles Kindleberger, in J. N. Bhagwati, op. cit.

It may be significant that these two groups have also tried to incorporate education into their forecasts, perhaps because they are committed to strategies of self-reliance which, in the educational field as elsewhere, involve breaking away from the orthodox picture already described and looking actively for new kinds of relationships between education, economy and society. The Bariloche group argue that education should be treated as a separate sector because 'it is a pre-requisite for generating a society composed of active, useful, participating individuals and groups'.[1.] Education is a basic need throughout the lifetime of the individual, and should not be treated as a means of adapting people to fit in with society, but of helping them to participate in the development of that society. They recommend a universal system of 'basic education' from the age of 6 to a point where the individual becomes 'educationally autonomous'. Middle-level and higher education should be used to train a 'critical mass' of persons concerned with administration, science and technology, and cultural advancement, on the assumption that at least 7 per cent of the population should complete the middle level, and 2 per cent the higher level. Special emphasis is placed on continuing education, to be applied to the adult population aged between 20 and 50, who would receive a total amount of instruction equivalent to 10 per cent of their active life, but split up into a number of time modules. Their calculations are that 12 per cent of the adult population could be provided for at any one time. Finally, compensatory education would be provided for adults who did not receive a basic education.

Given a doubling of GNP per head in Latin America between 1980 and 2000, their model shows that these levels could be reached by 1990; given similar assumptions for Africa, it could be reached by 2010. In Asia, because of population growth and low food production, the model is more pessimistic.

The Club of Rome report on the NIEO, directed by Jan Tinbergen, arrives at similar conclusions.[2.] Like the Bariloche group, Tinbergen and his colleagues began with the concept of basic needs which should be satisfied by a just world order. Education is seen as the most important non-material component for fulfilling individual ambitions. Practical education contributes to practical objectives like health and housing; at a higher level, it helps to prepare individuals for the problems of a changing world. The actual form of education should be adapted to the culture and socio-economic aims of a given country or region. Secondly, they argue, it is essential to provide a 'broadly educated political class' which is capable of understanding science and technology and their potential rôle for constructive social purposes. Thirdly, the application of technology to economic and social progress requires appropriate educational policies, including measures to counteract the brain drain.

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1. Amilcar Herrera et al., Catastrophe or New Society? Ottawa, IDRC, 1976, p. 77.
2. Jan Tinbergen et al., RIO - Reshaping the International Order, N. Y, Dutton, 1976.

Policy implications

We may now look briefly at the implications for policy which flow from the preceding analysis.

Educational planning can be a significant input to forecasting, especially because the effects of decisions made now will extend for at least a generation ahead. Hence, it is important to avoid faulty theories about the social rôle of education and its relation to economic progress. The debate about education and its place in the NIEO runs closely parallel with debates about strategies of economic development. The 'basic needs' approach casts doubt on the value of industrialization, but as the 'Leontief' report for the United Nations points out, there is no alternative for industrialization as a method to raising living standards on a large scale.[1] The correct answer appears to be a balance between the two strategies. Industrial development is essential, but the virtue of the basic needs approach is that it defines a set of objectives towards which industrial development should be directed. The recognition that both strategies are necessary is one of the particular strengths of the Bariloche model and of the Tinbergen/RIO report. In the case of education, we have a corresponding tension between the 'human capital' or 'high-level manpower' strategies and a 'basic education' approach. Curle, for instance, whose general tendency is to support the basic education philosophy, also stresses the need for a 'new class' which can take the lead in development. 'In order to develop', he writes, 'a country must have a very considerable proportion of trained and educated citizens, not only to act as doctors, engineers, teachers, agriculturists, scientists, and the like, but to create a new class sufficiently large, and hence sufficiently strong, to establish its own values of justice, selection on merit, flexibility, expiricism, and efficiency'.[2]

Failure to recognize that education has potential both for greater equality and greater inequality is one of the most serious shortcomings of the 'economistic' approach. No society has been able to resolve this paradox, whose intensity is underlined by a recent study of school performance in Poland. A team of sociologists examined the relation between parental education and occupation on educational performance among 11 year olds in Warsaw. They found that the link was just as strong in this case as in the numerous studies conducted in North America and Western Europe, despite the fact that the rebuilding of Warsaw since 1945 has emphasized the even spread of schooling and other social services. 'An egalitarian social policy executed over a generation failed to override the association of social and family factors that is characteristic of more traditional industrial societies'.[3]

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[1] Wassily W. Leontief, The Future of the World Economy United Nations, 1977.

[2] Curle, op cit. p. 156.

[3] A. Firkowska et al., 'Cognitive Development and Social Policy', Science, Vol. 200, No. 4348, 23. 6. 78, pp. 1357-62.

The growth of hierarchy based on education is, then, part of the price which must be paid for the benefits accruing to society from improvements in skill and the growth of an educated public. The task of educational policy is to restrain and regulate this growth and to ensure that it does not prejudice the realization of the egalitarian potentialities of education. As Balogh has argued forcefully on a number of occasions, policies based on macro-economic projections are inappropriate for developing countries, especially because they ignore the fact that, without proper social organization, growth means a vast and pervasive increase in inequality.[1.] But similar criticisms may be levelled at proposals based on 'non-formal' education, on the assumption that it will avoid the difficulties created by the reliance on Western models.[2.] Dore, while approving of the general approach, points out that no educational policy can be wholly based on informal methods, and that it is essential also to reorient the formal system.[3.] Patrick von Rensburg, well known for his attempts to integrate vocational instruction and work experience in Botswana, also underlines the need to control the relationship between academic and vocational education. 'In countries with a hierarchical social structure, rigid selection and its corollary of exclusion at cut-off points in the educational system, come to determine pedagogy .... Educational history is littered with examples of efforts to provide popular education which result in dual systems, one having status and prestige and the other being poorly regarded .... The fate of Gandhian basic education is a good example of what happens to alternatives in a dual system even when backed by a formidable individual. Only a few isolated relics survive with limited economic and pedagogical benefits'. Only the political determination to make the system combine work, vocational training and academic instruction, as shown in varying ways in countries like China, Tanzania, Cuba and Sri Lanka, can bring these objectives within sight of success.[4.]

Another warning against pinning too much faith in vocational, non-formal methods is given by Foster. Like other students of the relation between education and society, he warns against excessive reliance on using schools as agents of social change. Advocates of non-formal, integrated vocational/instructional projects, he observes, 'expect far too much from the schools, and certainly anticipate far more from them than has ever been possible in even the most economically advanced nations'. The most important effect of education may, indeed, be indirect, in that it raises aspiration and thus stimulates action to raise living standards.[5.] A related point is made by Dore in reviewing

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1. Thomas Balogh, Planning for the Second Development Decade Paris, IIEP, Fundamentals of Educational Planning series, No. 54, 1970.
2. P. H. Coombs and M. Ahmed, Attacking Rural Poverty Baltimore, Johns Hopkins U. P., 1974
3. Dore, op. cit. ch. 7.
4. Patrick von Rensburg, In Prospects, Vol. 7, No. 3. 1977
5. Philip J. Foster, 'The Vocational School Fallacy in Development Planning', in Anderson and Bowman, op. cit. p. 161.

the experience of Tanzania. The 1967 programme of 'education for self-help', adopted after the Arusha Declaration, had the effect of downplaying academic education too much and thus retarding the development of skills and attitudes conducive to economic growth, which has been disappointing and has left Tanzania among the world's 25 poorest countries. Academic education, Dore contends, has the virtue of encouraging respect for hard work, self-discipline, and perseverance.[1.]

The nature of the link between instruction and employment is plainly central to the problems of education in both the developing countries and the affluent industrial societies, and much thought and planning have already gone into attempts to change it. One of the keys to this situation is to be found at the secondary level, where work/education relationships become clearly differentiated for most of the adolescent population. (By 'secondary level', we mean the stage beyond elementary schooling in basic literacy and numeracy, where instruction becomes organized around subject divisions.) Secondary education is problematic for a variety of reasons. For one thing, it takes place at a particularly difficult time in human development, when the onset of puberty creates personal problems for the students, for their teachers, and for their parents. Motivation to learn is thus badly affected. It is also affected by uncertainty about careers, and by the increasing disjunction between school and the outside world, with which adolescents find it much harder to cope than adults. Secondary schooling is inefficient because it imposes a tight framework on a heterogeneous population, and because subject specialization cuts down contact between teacher and pupil as compared with primary school. Adult students can absorb the intellectual content of the typical secondary curriculum much faster and more effectively than adolescents.

The need for reform at the secondary level has been recognized by a number of people. On the one hand, the integration of technical training and academic instruction is the policy favoured in countries like the U.S.S.R. A more radical approach would be to abolish secondary education altogether, at least in its present 'end-on' relationship to primary school. This approach is favoured by Dore, by Husen, by the Bariloche report, and by the Europe 2000 report on the European Cultural Foundation, which suggests that the present secondary level should become an exploratory phase, 'an amalgam of the school, the youth club and the cultural centre'.[2.] The educational pyramid would become flattened so as to minimize the proportion of persons who continue their formal education beyond a common basic standard - cutting out at the 14/15 age level - and to maximize the numbers of those whose subsequent careers involve intercalated arrangements of work and formal instruction.

Another effect of restructuring schooling in this way would be to reduce the 'updraft' effect which the expansion of secondary schooling has had on tertiary education. Restriction of the continued growth of tertiary education, at least in its traditional forms, is clearly in the interests of many countries, but is politically highly difficult to bring about. Breaking the present nexus between the secondary and tertiary levels presents an interesting possibility.

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1. Dore, op. cit.
2. G. Fragniere (ed.), Education Without Frontiers London, Duckworth, 1976, p. 158.

CONCLUSION

We may conclude by summarizing some of the strategies for action available to Unesco and IIEP which flow from the preceding discussion.

(1) Development of regional models. Most macro-models of the future suffer from over aggregation or 'over-globalization', and the social rôle of education has been oversimplified as part of this process. It is illogical to speak of the rôle of education in society. Different institutional practices, social structures, traditions and access mechanisms make the links between schooling, work, and social rôles very different in different countries. As the Bariloche group has shown, however, it is possible to construct regional models in which education can be appropriately incorporated.

(2) Improvement of data collection. The collection of data on education should be revised so that the real character of educational inputs can be identified and compared (although no perfect system is possible). As Coombs pointed out in 1968, it is fallacious to imagine that quantitative expansion without changes in structure, content, or methods, can benefit society.[1] For many years, however, too much emphasis has been laid upon quantitative expansion as an index of educational progress. The structure of education is, in any event, changing under pressure of current problems, and new measures are required to provide more meaningful data.

(3) An emphasis on the reform of secondary education. Special attention should be paid to the study of experiments already going on in this area, and to the possibilities of more radical changes, both in structure and in curriculum.

(4) The relation between education and employment. It is widely assumed that education and employment should be made to interact in new ways in order to undercut the widespread and deeply-embedded problem of unemployment. Educational planning, in other words, should proceed hand in hand with employment policies. In a changing world, three kinds of changes are constantly interacting - in jobs, in information, and in social situations. Individuals should have the chance to review these interactions at periodic intervals by access to continuing education. At present, people are either employed, unemployed, or in full-time education, with fairly rigid segregation between the three statuses. A breakdown of this segregation would be to the advantage of society at large and to the advantage of many individuals. This breakdown would also help to reduce the problem of 'mismatch' between education and employment, since it would provide more

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[1] P. H. Coombs, The world educational crisis - a systems analysis, London, Oxford University Press, 1968.

opportunities for remedying and overcoming existing forms of mismatch. Castle has gone so far as to suggest that international aid programmes should be subject to the criterion that they are aimed at the relationship between education and employment. He argues that the growth of education in the developing countries must be selective, and aimed at programmes which relate school places to job appointments.[1.]

The above propositions have been enunciated without making a sharp distinction between rich countries and developing countries. Although their problems are clearly different, the implications of education cut across these differences and there are advantages in treating the world as one parish so far as education is concerned.

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1. E. B. Castle, Education for self-help, London, Oxford U. P. 1972.

THE PLACE OF EDUCATION IN LONG-TERM PROJECTIONS FOR DEVELOPMENT

by R.M. Avakov and P. Zagefka

PREFACE

One of the features of our present times is the growing insistence with which men, nations and the entire international community are questioning the future of mankind. The long-term prospects for development are at the centre of many national and international discussions. This is by no means a passing phase. Man's future and the future of human society concerns everyone and to an ever increasing extent. Even sceptics who doubt the usefulness of forecasting and futurology cannot deny the justification for such concern.

Even though mankind has wondered about the future of humanity since thousands of years, today there are new and fundamental factors which make the present significantly different from previous periods in the development of human society and emphasizes even more the vital importance of questions regarding the future, i.e. the scope of the problem and its global character, the speed with which changes occur in the development process, and the shrinking of the distance between the present and the future. In other words, the difference compared with the past lies in the fact that:

(a) Nations and the entire international community are having to contend with a definite tendency for an increasing number of human problems to take on worldwide dimensions. Which requires, on the one hand, a new vision of these problems, a global vision so that they are seen in all of their interrelationships and never in isolation and, on the other hand, joint efforts at regional and international level. What is more, it should be remembered that some of these global problems are becoming urgent and require immediate joint action.

(b) Never before has there been such close inter-dependence between the present and the future, to the extent where they have to be considered together, as a single unit. The future is shaped today and the present is governed by the needs of the future - should not this idea form one of the essential bases for policy-making if one is to prevent the rapidity and the immensity of change from outstripping whatever measures are planned?

(c) The limits to natural resources and the need to use them rationally and safeguard the environment are clearly apparent as a strategic factor in development. It should of course be stated that these are not absolute limits, i.e. if certain of nature's resources are exhaustible, nature herself is not. History is full of tragic events which have brought about the destruction of cultures, empires and races, but mankind has always found the strength to continue and to progress. Which does not mean that today there is no danger and that everything will right itself automatically, that the process of development will itself produce the appropriate solution when the time comes. The problem is to avoid falling into this trap whilst, at the same time, resisting the temptation to over-exaggerate the "dangers" with which nature is threatening us. The dangers are much more of the socio-political kind.

Thus, the three new factors which impinge upon the elaboration of development strategies and underline the prime importance of the questions concerning mankind's future, could be expressed in the following terms:

- the interdependence in terms of space - the worldwide extention of the human problem;
- the interdependence in terms of time - the "present/future" entity;
- the interdependence in terms of the utilisation of natural resources.

INTRODUCTION

Ever since the international organisations began their discussions on the New International Economic Order it has become obvious that this covers a variety of different meanings. However, what these all have in common is a global outlook, without this necessarily implying the use of a phrase like "the spaceship Earth". The expressed intent to resolve jointly problems as important as feeding the world's population or the control of natural resources, disarmament and peace implies a pooling of interests on an international level to combat deficiencies and shortages which, in the absence of appropriate action, can only worsen.

In this one can discern two elements, i. e. the forecasting of the future, with all that this implies in terms of research to discover and define the critical points and the worldwide perspective in which this is placed.

But, prior to any forecast and prior to any attempt to construct appropriate and relevant models to represent the future, the essential point of departure is an analysis of the present - an analysis of the present in a worldwide perspective. The different conceptions of development can only stem from an analysis of the present in which under-development is the determining factor.

The belief, which was current in the sixties, that education was in the case of most countries an essential factor in economic development, has been challenged. For a number of years now, as a result of partial or complete failures, there has been a shift of opinion in favour of an explanation which puts prime emphasis on the socio-economic structures as the root of underdevelopment, of which education therefore is seen as an integral part. Education is always mentioned as being a fundamental human right but it no longer seems capable, by itself, of solving the economic as well as the social problems of a country. It is not even possible to extend this right to every child and the reasons for this have to be sought outside the educational system, e. g.

- discrimination on the basis of class and sex;
- racial, ethnic and religious discrimination;
- regional disparities;
- economic exploitation and discrimination.

Roughly twenty years have passed since most of the former colonies gained their political independence but the problem of underdevelopment still exists. Before the end of the second decade, the theory had been abandoned that underdevelopment was the outcome of a delayed historical progress which could be remedied by international co-operation and temporary assistance. The current emphasis is on the dependence of the periphery vis-à-vis the capitalist industrialised centre - a dependence which is expressed in economic terms (the accumulation of capital on a world scale, the international market, the export of capital, the rôle of the transnationals etc.), in social terms (the support of national elites and the groups in power) and in cultural terms (the predominance of methods of training and types of know-how and techniques derived from the centre).

Education does not fall solely within the context of cultural dependence - it is conditioned by, and reflects, all the forms of dependence. Education is subjected to the logic of economic conditions and constitutes a human right.

The permanence of this state of dependence and, in some cases, its worsening, together with a certain desire to negotiate new relationships between rich and poor countries (e. g. the North-South dialogue) have resulted in the formulation of a development concept sometimes termed collective self-reliant development, based on national independence and freedom of action with however the occasional need to accept temporary restrictions on this. This desire for a return to national roots embraces a variety of attitudes ranging from ethnocentrism and nationalism in word or deed to demand for the establishment of equitable relationships between countries, wherein regional and international co-operation would find its rightful place.

Within this framework educational development is expected to draw upon national sources as much as upon co-operation and joint efforts in solving specific educational problems, the emphasis however being on the importance of the national contribution.

The aim of this present document is to highlight the critical points in the current debate on the relationship between development in the future and education, and education's place in the long-term forecast. After the grandeur and decline of the concept of education in vogue in the sixties, most experts and politicians are unanimous about the need for change.

In fact, in order to remedy a whole set of critical educational problems, it is now sufficient merely to "reform", "restructure" or "transform" the educational system.

The reappraisal which occurred towards the end of the sixties, calling into question all of the factors involved in the educational system and transmitted by it, indicates by its critical approach that the problems are legion and as much socio-political as economic in origin and that educational "reform", in the broadest sense of the term, would only achieve partial results.

However, it is important to emphasize the need for such changes within the context of the New International Economic Order, through the elaboration of educational strategies which are feasible and desirable from a national and international viewpoint.

As possible directions for research one could quote the following:

- the various methods for developing strategies,

- the relating of partial national analytical studies in the education area to global strategies and the feedback effect,
- dissemination,
- evaluation: validity and pertinence; readjustments at local and national level,
- the methods of intra-regional and international co-operation,
- the authorities participating in the elaboration of this entire process.

The European countries, through their system of regional co-operation, have already laid down guidelines implemented by various research centres (e. g. the Council of Europe, OECD, Europe 2000). Nevertheless, most of these guidelines originate from the political authorities in power, in this case the governments of the countries concerned, (e. g. the French Plan, the work of the West German Bildungs kommission etc.) and only embody to a very limited extent the alternatives suggested by other social groups whose active participation is limited.

As for the so-called Third World countries, with the exception of those which have only recently acquired independence after long periods of struggle (e. g Viet Nam, Angola, etc.), only their five-year plans contain some indication as to specific educational policy.

With regard to research carried out by experts, and thus non-governmental in origin, the only forecasting model for the Third World giving sufficient emphasis to education is the Bariloche Plan.

The other models presuppose changes in matters of education but given practically no precise details, either with regard to the overall implications of education concerning the critical aspects of the future, nor with regard to education as a means of training the labour force.

In fact, the ideological crisis which has also shaken belief in the power of the "school" and "knowledge" has not produced any concrete alternative proposals.

A simple extrapolation of past trends reveals the widening rift towards which the present situation is heading. But there is no doubt that this method provides what is the most realistic, at least over the short term, and at the same time the most pessimistic vision of the future. The system of models claims to be the most "neutral" method of forecasting although, because of its formal techniques, it may well be of limited application for specific countries. What is more, it still has to be decided in what way this could be used in forecasting quantitative and qualitative educational development.

As opposed to this, a normative approach would appear more suitable in the current situation, in that it answers the demand for the formulation of an explicit policy; where education is concerned, this would mean in concrete terms that, prior to any action in the direction of innovation or structural change, the political premises and intentions, which were to be embodied in the programming of the projects to be undertaken, would be made explicit. In highlighting the importance of the normative approach, we have obviously not clarified the question of the decision centres responsible for defining objectives and the actual implementation.

The normative approach does not imply anything arbitrary or irrational and even less political authoritarianism. It tends rather to highlight the alternative courses of action available to us for dealing with the manifold problems and even "challenges" which all of mankind will have to face in the not-too-distant future.

The normative approach thus tends to integrate within the rational knowledge of the present and the future all of the aims, intentions and choices which seem to be deliberately excluded from models.

Despite the variety of interpretations, the New International Economic Order fits into the framework of a normative approach particularly since, in our view, to confront desires and visions of the future with reality is never a valueless exercise.

PART I

EDUCATION : PRESENT PROBLEMS - FUTURE IMPERATIVES

The term education covers a series of concrete processes, whether institutional or not, in addition to the theoretical interpretations given it. Despite its broadness, the term is nonetheless a useful one in that it embraces a whole series of mechanisms which one could describe, without the risk of being tautological, as the processes whereby mankind transmits and inculcates knowledge, know-how attitudes, behaviour, rôles etc. in the younger generation. But, going beyond this very general description, the term implies an institutional reality which differs from one country to another, irrespective of whether it is called the educational "system" or "sector" and despite the fact that this differentiation may well provoke acrimonious discussion since it induces allegiance to different explanatory theories.

In the main however it would seem that the term is generally accepted even when it is a question of processes concerning and designed to include the entire population of a country. It is in this context that one should look for the coherence or even the incoherence of national policies with regard to education as well as the differences and disparities which result from them, whether these be termed inequalities or contradictions. In other words, in order to determine the various functions of the educational processes one should, in our opinion, look for the differences with regard to their actual method of operation. A first set of differences are already defined by the very structure of institutionalised education with its primary, secondary and higher levels. The transmission of knowledge and the allocation of rôles and behaviour patterns are not the same for everybody.

Although educational sociologists in the sixties assigned two fundamental rôles to education, i.e. that of socialisation/adaptation and that of transmitting knowledge, economists placed emphasis on the second of these, whilst at the same time assigning to it the rôle of a "third factor" affecting growth and development.

The adaptational and socialising rôle, the rôle of social "reproduction", the rôle of supplying manpower and skills - none of this helps to provide a theory, primarily explanatory, of the social process which education is in its various institutional forms; even if the need, not to say the "omnipresence" of this process, is highly prized by all, it is interpreted in different ways. Education can be considered a consumer good, with the individual as its central justification, and, at the same time, as a capital good where society, in the narrow economic sense, is central.

This by no means implies that the school does not socialise or assign social and economic rôles, but this socialisation takes place within the education/training process through the transmission of knowledge.

The long-term forecasting of development can only be based on existing analytical studies, although these can only serve as a starting point.

To emphasise one or other rôle of education must surely not constitute an obstacle to the definition, within the framework of a global forecast, of other and new rôles which should then become part of the global development concept.

Any analysis and any attempt at evaluating the educational sector can only take place within and on the basis of a global analysis; the different patterns assumed by the educational process are the result of the interaction of economics, politics and culture at a given moment in a country's history, that is to say, interaction which is conditioned by a specific historical context.

The question is not merely of a methodological kind. Despite the methodological problems involved in measuring educational facts, particularly on a worldwide basis, the main obstacle is the difficulty of combining quantitative and qualitative analysis, if by "qualitative analysis" is meant the perception of differences between patterns in the educational process; the difficulty becomes even greater when one adopts a worldwide standpoint.

Although such an undertaking might not seem completely beyond the reach of industrialised countries, for the so-called developing countries it raises problems which, at least at the moment, are difficult to resolve.

However, in the absence of a theoretical approach combining the quantitative and qualitative aspects one is obliged to fall back upon existing quantitative data despite their diversity and meagre explanatory value.

These quantitative data, particularly when they go beyond the limits of an individual country, in most cases conceal quite different situations. Even in the case of the educational minimum i. e. literacy, its measurement depends not only on the definition of literacy, formal or otherwise, but also on all of the factors comprising the social and natural environment; one cannot therefore omit from a definition of literacy the relative knowledge which individuals have of their surroundings. In this context, urban illiteracy means something different from rural illiteracy as does in the case of the latter, the illiteracy one encounters in forest regions compared with that in desert areas. In fact, the conclusion here is that literacy is not confined merely to the three R's but also implies the individual's insertion into the natural and social conditions of his environment.

This is not just a question of the appropriateness of the indicators and parameters used. As soon as one attempts to adopt a worldwide, or even regional, viewpoint the statistical data, despite the efforts of the international organisations, raise problems with regard both to the realities to which they refer and the validity of the national statistics. When there is not a complete absence of data, the way in which these are collected does not always correspond to the norms, particularly where such data have to be standardised. Suddenly, one is brought face to face with the difficulties which arise when innovations are put into effect; the argument of numerous researchers and experts in favour of abolishing institutional educational structures, at least in certain regions, conflicts with the progressive and parallel elaboration of methodological parameters for measuring such change, e. g. the level of instruction is always measured by a combination of the number of years' study and the diplomas obtained by the school. Similarly, the ruralisation of education raises problems with regard to its measurement and overall evaluation against the accepted norms. One is therefore obliged to resort to partial analyses and case studies, which, despite their value in terms of their qualitative content, can only be of very limited use on a national basis. All of this is by no means restricted to innovatory experiments and pilot schools; it is equally valid in the case of the disparities encountered within the institutional educational structures.

But the argument in favour of doing away with educational structures does not raise problems only of a methodological kind: the main problem is its aim and, firstly, its social aim; what effects will the abolition of existing educational structures have upon a population which, as in most countries, is already suffering from severe inequalities of which the most important is the difficulty and even impossibility of access to knowledge of all kinds, both general and technical, to the common language, i. e. the official language and, as a result, to political power?

Thus, the existing intranational and international disparities are compounded by disagreements regarding the methodological tools currently in use as well as disagreements concerning the range and validity of the basic information derived from the statistics.

However, these theoretical and methodological obstacles should not result in inertia - the impact of the existing data is far from insignificant.

It is obvious from what has been said earlier that, in matters of education, there is a demarkation line between industrialised countries and developing countries. The existing statistical data, as well as a large number of analyses by experts, reveal serious shortcomings, inadequacies and deficiencies - defects which will tend to worsen under the influence of factors external to education, making concerted and rapid action imperative. The countries of the Third World do not of course constitute a bloc; on the contrary, even within a single region the differences still predominate. Although, in the interests of structuring a problem, one is often obliged to define a field of research and analysis on the basis of one or two common features, this does not detract from the fact that differences exist between countries as well as within individual countries. Defining such differences and disparities is of prime importance not only with a view to refining one's knowledge, but also with a view to elaborating alternatives and strategies as a basis for future action.

1. Developing countries

It is a well known fact that literacy and semi-literacy affect rural more than urban populations, women more than men, more the ethnic, racial and religious minorities, populations in desert regions more than those in rich and fertile regions, the poor who are the exploited and oppressed more than the privileged classes.

In the case of most Third World countries a literacy programme is a prime economic and political necessity whose importance cannot be overlooked in any long-term, overall development forecasts. The planning and execution of a national literacy campaign presupposes a deliberate political decision and the mobilisation of the country's entire material and human resources to ensure its success. National campaigns of this kind do not rule out limited programmes designed as short-term solutions to specific local problems.

On the other hand, what is most important is to provide adequate means, not moreover as the direct responsibility of the literacy programme, to prevent the adults and children from gradually slipping back into illiteracy.

In this way, a literacy programme would have a true feedback effect, via those who had learned how to read and write, on the socio-economic and political environment, which would be transformed as a result.

A literacy programme, however, should not confine itself to teaching the three R's; it must include learning about the environment in all its aspects as well as the ways in which the individual can influence this.

Can the problems of child illiteracy be solved by providing everyone with a basic primary education? And what is the precise significance of this for forecasts of the future?

The "basic education" thesis favours the following orientations:

(1) The introduction of a 4-5 year primary cycle aimed at providing every child with a minimum basic knowledge rather than an attempt to enrol every child for a longer, 7-8 year cycle, which would not be financially feasible at least for the next twenty years.

(2) The introduction of a special form of primary education for children who will not continue their studies beyond this but go straight into "active life".

(3) The eventual "ruralisation" of primary education.

(4) The introduction of a certain amount of flexibility into the school system through the creation of "bridges" between the various cycles and streams, compensatory classes and orientation courses with the aim of singling out the most promising pupils.

It is very important that a country should attempt to provide all of its children with a basic education by reducing, in an initial phase, the length of the primary cycle so that adolescents and youngsters do not reach a "point of no return" as the result of a total lack of basic knowledge. But this is only valid as an initial phase; even in the case of serious deficiencies, the policy should be to introduce progressively a common core for children up to the age of 14 or 15.

On the other hand, to divide primary education into two distinct cycles and organise this, for a certain number of school children, in relation to a subsequent form of employment - in which process would be included an attempt to "ruralise" schools in country areas - would only be to institutionalise inequalities already existing outside and prior to school by a selective mechanism which, over the long term, could easily become self-perpetuating.

Basic education in fact, although it is regarded as a short-term educational development strategy, an emergency measure, cannot be considered as the fundamental concept for the future.

It would only contribute to the institutionalisation of an "unequal" form of education which would be strengthened even further by existing disparities and inequalities. Moreover, basic education can eliminate neither wastage nor failures. These phenomena, which are of considerable magnitude, are not exclusive to developing countries; failures, repeaters and drop-outs are also a common feature in industrialised countries, but in Third World countries they reach gigantic proportions. The reasons for this are not to be sought solely in the quality and alleged "incompatibility" of the teaching and educational structures patterned by Third World countries on the educational models of the centre.

In fact, the root cause of the difficulties encountered in any attempt at universal education lies in the socio-economic conditions of the populations concerned.

Education in the future will have to face up to the problems of socio-economic inequalities and try to help solve them.

The introduction of compulsory education is not a sufficient remedy in itself, particularly if this education tends to detach the child from his environment. Moreover, it is obvious that, in the case of children inserted very early into the production system, their grasp and understanding of reality are different. Education should be able to develop this understanding by giving it a new sense and orientation.

The other problem of developing countries, although to a lesser degree, is the training of technical and scientific personnel, particularly with regard to gearing this training to the economy. We are referring here to senior and middle-grade technicians and engineers as well as skilled workers. The training of technical staff cannot be planned without regard to economic development. The planning of vocational training presupposes and makes necessary the forecasting and planning of economic development. The division created between education and training causes serious deficiencies in developing countries and loss of lead time which it is difficult to offset by short-term training programmes of a forcibly limited effect in time. In the capitalist industrialised countries the division between general education and vocational training is currently being subjected to sharp criticism both as a possible source of social conflict as well as on grounds of technical and economic efficiency. This continues, however, to be the fundamental orientation in developing countries; the setting up of a system of vocational training, because this has priority importance for the country's development, is not regarded from the standpoint of its integration within the educational structures.

Educational development is not conceivable without some attempt to establish a close link between education and training. A parallel problem to this lack of adequate vocational training to cover both the needs of the present as well as those of the future is the "massive" output of graduates from higher education - massive not in absolute terms but in relation to the number of available jobs.

In fact, vocational training programmes at all levels can only be devised in close conjunction with the present and foreseeable conditions of national and international production, which presupposes the forecasting and planning of the national economy in relation to the evolution of the world economy. The ultra-modern training programmes in most cases serve the interests of a minority which, at the end of their training, can no longer integrate into their national and regional environment.

Short apprenticeships and training courses, despite their usefulness in remedying certain labour shortages at a local level, cannot provide an overall long-term solution. The same is true of every type of highly specialised training which fixes individuals in specific jobs or sectors whose future is by no means assured.

It should be possible to incorporate technical and scientific training right from the start of formal education, as part of a common core. In this context, one could draw guidance from the experiments which several developing countries have been conducting for a number of years (e. g. India with the Gandi schools, Sri Lanka, Tanzania, Ghana, Viet Nam, etc.) and whose main feature is an attempt to integrate work, in this case rural or craft work, into the school curriculum.

In addition, there is the progressive initiation into work in school workshops and factories and even in firms, which is a feature of the school system in socialist countries organised on the basis of polytechnic education. The courses of initiation into productive work also serve as a form of vocational guidance by exposing the student to the various productive occupations.

2. Developed countries

Whereas the developing countries are suffering from serious deficiencies in terms of education and can no longer cope with the financial burdens of a genuine expansion in the system, the capitalist industrialised countries, with their century-old educational structures, have witnessed the birth of an "education crisis" which, among other things, has been the result of mass education and the extension of the system to vast sections of the younger population. Education is becoming an "industry" by virtue of the resources and the amount of manpower it employs - the teachers - but also by virtue of the millions of youngsters it concerns.

What are the features of the educational system in these industrialised countries?

- Universal basic education, characterised by the continuous extension of the period of compulsory education and its corollary a general rise in the standard of education.
- The organisation of vocational training alongside the school system and similarly accredited by the award of diplomas; this training is given either in firms or by simulation in school workshops.
- The retention of certain traditional school structures such as the classical high schools which, despite the gradual broadening of their programme to include modern streams, maintained until recently a relatively closed attitude towards the world of work and the economy.
- University education of a high level, although there are differences between the various institutions, the types of training and the prestige of the degrees awarded.

Mass education together with a growing demand on the part of the population has meant that an increasingly larger share of national resources is being devoted to education - a share which the industrialised countries are finding they can no longer continue to increase.

What is more, the progress of events in the sixties i.e. the scientific and technological breakthrough, the growth in industry and employment, has led to an expansion of education within its traditional structures whose limits, in both quantitative and qualitative terms, quickly became apparent. The ideological crisis and the student protest at the end of the sixties underlined the inadequacy of, in this case, university education, although this inadequacy exists in a variety of forms. Moreover, it was already apparent even by 1965 that employment was already beginning to level off, which only served to increase the general discontent and cast doubt on the value of education and diplomas in securing a job. The subsequent economic crisis set real limits on education budgets and, combined with general measures of restriction, caused a halt in the expansion, particularly in the case of universities; the need for a restructuring, if not a radical revision, of education in all its forms became increasingly apparent. Thus, the education scene in the industrialised countries is characterised by the following trends:

(1) The development and elaboration of policies with regard to compensatory education.

(2) The spread of secondary education, but in the direction of a vocational orientation and a differentiation.

(3) The extension of compulsory education, enriched with new subject-matters related to the world of work; the selection process is brought forward in time and made dependent on the orientation.

Attention has been frequently drawn to the crisis affecting education in certain of the industrialised countries, but it is viewed in very different ways by the groups involved, i.e. educators, parents, firms, administrators etc. These differences of opinion regarding the crisis play an important rôle and must be taken into account when devising reforms and strategies for educational development.

The factors undermining education call for urgent reform and for the focussing of attention on the entire political and socio-economic context in which the education system operates.

The educational "explosion" has revealed the need for:

(1) A redefinition of educational objectives in line with the global plan for society and after consultation with the political authorities and social groups concerned.

(2) The preparation of adequate frameworks for action taking into account the present and future impact of socio-economic, scientific and technical changes.

(3) A restructuring of every kind of educational process (from the nursery school to the system of school administration) and the setting up of new and alternative structures.

(4) A revision and reformulation of the contents, methods and the entire educational system in general.

(5) A thorough reappraisal of the teacher/student relationship and the rôle of the "teacher" in general within society.

EDUCATION: A GLOBAL PROBLEM

The differences and similarities in the education situation worldwide should constitute the two central themes for a joint reflection between industrialised countries and developing countries. Isolating common viewpoints, formulating basic orientations and forecasting future trends all assumes a willingness on the part of governments and nations to "learn" from the experience of others in an atmosphere of agreement and mutual respect, but without however loosing sight of the fact that the main development effort can only be national.

Learning from the experience of others also brings into focus the vital rôle which international and regional organisations must play in the dissemination of information and the pooling of both material and human resources for the elaboration of educational strategies.

These common viewpoints with regard to education will be determined both by:

(a) the common material conditions e. g. resources, energy, food etc. which confront every country to a greater or lesser degree - amongst which conditions, scientific and technological progress plays a predominant rôle;

(b) and by the national and regional conditions more closely linked to the history and culture of each group and each region.

If the international educational co-operation within the context of the New International Economic Order is to be both valid and viable, it must be based on a joint assessment of the current and future development of science and technology as well as of the national realities and projects of each country.

Although these national realities and the corresponding plan for society can only be defined in the last resort by the countries themselves, it is the task of international co-operation within the context of the New International Economic Order to define and delimit the specific worldwide conditions.

The final objective would of course not be solely to prepare detailed diagnoses using sophisticated analytical techniques, but to draw up guidelines, strategies or models of possible and desirable frameworks for action with regard to educational development.

However, it would be interesting, prior to any definition of possible alternatives, to submit for general discussion the question as to whether, and to what extent, education is a global problem like the problems of population, food and energy.

The debate could centre around the following themes:

- What linkage is possible between education in a global sense and education within individual countries?
- What is the rôle of international and regional co-operation in determining such linkage:
  - the elaboration of the methods of "diagnosis",
  - the design of alternative scenarios, constituting a series of typologies of possible frameworks for action,
  - international and/or bilateral aid in the preparation and administration of educational programmes, either general or specific to a sector,
  - or the evaluation of national programmes and the exchange of experience ?
- What link is there between education and the major world problems as defined in the existing models, e. g. material resources, food, population etc?

As for forecasting a framework for action with regard to educational development, the whole question of models requires further elucidation. What in fact are the available options:

- a single global education model;
- different educational models depending on the degree of socio-economic development, with, in parallel, the elaboration of alternative scenarios;
- the absence of any kind of model, with the countries themselves being entrusted with the task of defining their own strategies for educational development;
- or the elaboration of alternative global scenarios which would attempt to include the forecasting of possible sources of conflict?

The fundamental question however is still : how to relate the educational development model to an overall concept of development.

PART II

SOME ALTERNATIVES FOR THE FUTURE

1. The development of education

The outcome of the fundamental reappraisal of the present system of education has been a series of attempts to reformulate the aims and objectives of education; despite the fact that they had been applied only on a limited scale, the tendencies which have become apparent constitute concrete alternatives.

Amongst these new aims formulated with the object of remedying conditions recognised as being "obstacles" to development, both socio-political as well as economic, one can discern the following elements:

- a desire to "equalise opportunities" and to "make education more democratic" by allowing wider sections of the population access to schools;
- an emphasis on the importance of popular participation for which the school must prepare the population;
- the importance of controlling nature and the socio-economic environment through scientific and technical knowledge;
- the move towards a restructuring of educational patterns so that these correspond more closely to the economic needs of society;

and in a certain number of developing countries:

- the explicit intention to relate education to their own national heritage.

With the exception of aims of a specifically political character, one can identify two main themes which constitute two breaches in the traditional system of education and which tend in the direction of a "polyvalent" type of school.

(a) School and work

Link-up between the school and the economic sector:

- the introduction of manual work,
- the study of technologies,
- the teaching of sciences,
- the study of economic mechanisms,
- the labour legislation.

(b) School and society

Link-up between the school and the local communities, mayors, villages, etc.:

- the study of history and geography,
- civics and the study of how institutions function.

In addition, one should mention the attempt to establish an educational continuum by integrating school and life-long education, which obviously implies a search for new processes of learning. The importance of compensatory education should not be overlooked in the forecasts for economic and educational development. The respective emphasis on further training and professional retraining should be calculated (and forecast) in relation to national and regional economic needs.

In fact, even now it is hard to envisage what the outcome would be for a society with a system of lifelong education. It is moreover worth noting that the ingenious theories which have been developed on the subject of life-long education find little echo within the system of formal education. Any change within this system is very slow and encounters resistance - which cannot be dismissed as merely "resistance to change" - both from parents as well as from teachers and administrators.

In the preceding paragraphs we have been looking at those current trends which indicate the most likely direction of future changes in education. But the debate is by no means over. Interdisciplinary research brining together administrators, planners, educational experts, teachers, etc. on a regional and worldwide level needs to continue. Here are a few suggestions in the light of the current debate:

(1) With regard to teaching/learning methods:

- review the traditional division into units, i.e. class/lesson period/subject/teacher;
- what are the alternatives to individualised and competitive schoolwork;
- group work on a project involving several disciplines;
- level groups;
- group work by objective;
- or other teaching/learning methods?

(2) With regard to organisation and administration:

- the rôle, for example, of the college of education or the Academy, the organ for regional co-operation, organisation and liaison between schools at local level and the place for experimenting new methods and procedures;
- the organisation of possible forms of participation by parents, teachers, student-teachers, administrators etc.

(3) With regard to the evaluation not only of the educational process but also of the programmes of action as a whole:

- new procedures for collective evaluation; the criteria to be used, the appropriateness of such procedures when transposed to the national level; the related question of the purpose of national diplomas;
- critical evaluation of educational procedures as a whole; the feasibility of making certain adjustments;

- information and dissemination of information among local and regional educational units; evaluation within the region.

(4) Facilities:

- "flexible" and "transportable" educational equipment;
- possibilities of co-operation with local authorities for the use of public facilities;
- possible changes in school lay-out.

These few suggestions with regard to the direction the debate should take are neither exclusive nor definitive. They do however suggest various ways of structuring the educational system. Other questions arise with regard to the link between educational development and overall development:

- What are the possible means of linkage between educational objectives, social objectives and economic, scientific and technological objectives, and how can these be given practical form?
- How can one establish a link between the various forms of education and training and life-long education?
- What are the possible forms of participation by the population as a whole which will enable responsibility for educational processes to be assumed by the community?
- To what extent is it desirable - and by what means - to attempt to integrate school/working life and retirement within a single educational process?

2. The integration of education within the global development forecast

The possibilities for concrete changes in education are immense, but their content depends to a large extent on the direction given to overall development.

The present demand for more equality and parity between countries and within individual countries must find adequate expression in genuine changes in the educational system. Countries may resort to a variety of solutions but these must be directed to a common end.

Take for example scientific and technical progress: the current changes affect every country and there can be no disputing the fact that these should be given the widest possible currency with a view to solving mankind's fundamental problems. Education is intimately involved in this process and at every level, i. e. by training suitable individuals to take on the task of introducing, utilising and disseminating existing technologies as well as developing new ones.

This is just one example. Future education will abandon its ivory tower in favour of a much closer involvement in society as a whole.

The global economic models dealing with the fundamental problems which, to a distressing degree, face today's world are however normative to the extent that they define objectives. It is obvious that these objectives are not arbitrary. They are subject to the decisions and orientations of services operating within regional and international organisations. But these are not single objectives and there is a fairly wide scope for choice.

The uncertainty with regard to estimates of the future is universal. It can be defined in the following manner:

- the available sources of information with regard to the real potential of certain factors such as raw materials, energy etc. are relatively limited;
- the lack of "factual knowledge" which the structural hypotheses formulated in the models - even when these are alternatives - cannot eliminate;
- the uncertainties of economic policy, despite the desire to adopt a fundamental guideline within the context of the New International Economic Order.

The value of these models lies primarily in the systematic knowledge which they provide of the interdependence of various aspects of world development - which development requires that consideration be given to the totality of a country's problems, irrespective of whether it be an industrialised or a developing country.

The problem of education is however missing from most of these models; it figures implicitly to the extent that it is considered as an integral part of development, but it is not treated separately (with the exception of the Bariloche Plan); in the Rome Club's Tinbergen Model education is considered as a fundamental need whose satisfaction constitutes "one of the five pillars on which any attempt to construct a just social order should rest". The satisfaction of this need is an objective of paramount importance for all countries, irrespective of the way in which one defines the methods, duration and type of education required.

The concept of education as a fundamental need is based on the idea that education is primarily a consumer good, i. e. "the most important non-material element in the accomplishment of individual ambitions" (Tinbergen, 1976), despite the fact that its "external" effects on the environment or on health are considerable and can influence the direction of development. What is more, education and training at every level have a decisive influence on the "performance of the labour force" even when scientific and technological progress is treated as a separate factor.

In fact, once again the duality of education is clearly apparent, i. e. consumer good, fundamental need or capital good on which the return can only be got within the system of production; with this return being also double, i. e the return from education measured in terms of its own performance and its return within the economic system viewed in its entirety.

But to what extent would it be possible to measure the incidence of education, both as a consumer good and as a capital good, on development over the long term?

The question is how to integrate the forecast for education within a forecast for global development, particularly since global forecasts cannot be the sum of partial forecasts.

It follows that the frequently mentioned interdependence of economic and socio-political factors, as far as understanding the educational system is concerned, raises problems with regard to the quantification and optimisation of the educational process, although these two problems are not of the same kind. But what concept of "optimisation" would be valid for the forecast concerning education? How could one combine social optimum, political optimum and economic optimum within one and the same model? Or would not the only possible solution in terms of educational forecasting be the integration, within one model, of single economic optimum, i. e. of education therefore as a capital good?

At this stage in the discussion the essential point would be to determine, as the result of a broad discussion, the "right" orientation to be given to research in educational forecasting so as to avoid the problem of divergent viewpoints stemming directly from the different, if not conflicting, emphasis given to the various functions of education.

What then are the factors working towards a convergence between education as a consumer good and education as a capital good, and this within the framework of the long-term outlook for development:

- The harmonisation of social, political, economic and educational objectives, both nationally and internationally.
- The correspondence between the forecasts for partial systems, which presupposes a prior search for indicators capable of expressing the incidence of education on these partial systems, allowing for presently perceived tendencies such as the "flexibility" of labour, social and political "participation" etc.
- The incorporation of an analysis of the "external" effects of education, as well as their incidence on overall development; which implies not only the elaboration of adequate methodological tools capable of incorporation within the overall forecast, but also the discovery of ways of forecasting possible sources of conflict, "resistances" and other structural changes. It is at this point that one should factor in the understanding of such inter-relationships as education/population growth, education/food and agricultural problems, education/effects of scientific and technological progress.

In order to make these forecasts objective, i.e. to rid them of their subjective elements and reduce the margin of doubt as much as possible, one needs to use several forecasting methods simultaneously; this is of particular importance where education is concerned in view of the multiplicity of factors involved and the lack of knowledge concerning their overall effects.

In conclusion, a forecast for education which endeavours not to be one-sided, but rather to constitute part of a global forecast, highlights the need for international co-operation based on an inter-disciplinary approach - co-operation which would embody as much the normative element as advanced theoretical and methodological research.

A COMPARISON OF MAJOR LONG-TERM PROJECTION MODELS AND THEIR POSSIBLE IMPLICATIONS FOR EDUCATION

by Sam Cole

I. Introduction

At a seminar seeking to examine educational problems in the perspective of socio-economic development up to the year 2000 it is reasonable to ask whether the 'global models' developed in several countries and international institutions in recent years have anything to contribute to the discussion. Although these models are not concerned directly with education, it may be that the long term economic and demographic projections the studies provide could, in some circumstances, be of use in educational planning, particularly for estimates of regional demand for educational resource inputs (economic or otherwise).

The major purpose of this paper, therefore, is to describe the projections obtained from current global models, and to discuss the value of the results in providing alternative estimates of future requirements for educational resources. For example, forecasts of future population (in some cases, broken down by age groups) may provide a useful estimate of the numbers of people requiring education, forecasts of the composition of economies (at a regional level) provides some estimate of the demand for skills and forecasts of per capita and national income provides some estimate of the per capita demand and expenditure the models could provide useful and valuable information. All this assumes a somewhat 'historicist' approach and also assumes that highly aggregated regional statistics are of relevance in planning. It begs the fundamental question of 'education for what?' - i. e. how are educational needs related to the style of development envisaged. Different variables appearing in the models may however still be more or less relevant to a consideration of different education 'scenarios'.[1] Thus, having discussed the usefulness of the models in their own terms - largely as projective exercises - we question their usefulness in exploring other future scenarios, and describe the application of the Bariloche Latin American model for this purpose. Finally, modifications which may be required to make the models more relevant to a consideration of education and related policy are indicated.

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[1] The term scenarios here is taken to mean something much wider than merely a set of macro-economic variables (as it is commonly interpreted by mathematical modellers). It includes also a description of social, political and cultural variables.

II. The models and their results

The models so far constructed are designed to explore long term growth prospects on a regional basis. As such they deal mainly with macro-variables familiar to economists such as per capita incomes, volumes of trade and sectoral production levels. Thus, although the original " Limits to Growth" model claimed to be 'global' in terms of the variables incorporated as well as for the geographic region described, even that model did not contain an 'education' sector. Most of the newer models might be considered retrogressive in this respect. Only one model (the Bariloche Latin American World Model) contains an explicit description of the education sector, and this is considered later in this paper.

While this is not the place to describe in detail the contents of the global modelling studies, it is useful to have an idea of the major purpose and underlying assumptions of the models. There are now available several extensive critiques of current models including several by the present author and his colleagues.[1]

For the following discussion we draw on several comparative studies, " Global Models and their Relevance to Policy", and a recent RIO report on World Order Studies. Here we indicate only the major characteristics of the better known studies in Table 1[2].

The "Limits to Growth" study was concerned at a globally aggregated level with growth possibilities in the face of assumed raw material and environmental constraints; the "Strategy for Survival" and United Nations Input-Output studies were concerned with regional growth possibilities, and international trade and aid strategies for bringing about better global income distribution (the latter also focused on the environmental dimension): and the Bariloche Latin American World Model, with the possibilities of satisfying, on a regional basis and in an egalitarian manner, the basic needs (including education) of the population.

Given additional time for the preparation of this document it would be useful to have a more extensive summary of ongoing modelling efforts. Many of the existing models have been refined or elaborated, although to this author's appreciation do not extend the treatment of the education discussion. In general the trend is towards a more disaggregated treatment at the regional and sectoral level, improvements of the data base and of the treatment of trade and technical change, which would improve the usefulness of the model in other respects. Except for the Japanese Club of Rome model, published numerical results are not available for these new models, and therefore we confine ourselves predominantly to those illustrated in Table 1 and use these results to obtain very rough alternative estimates of future regional demand for educational services.

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[1] See for example, the comparative critiques in: John Clark and Sam Cole, Global models - a comparative study, Wiley, 1975. Sam Cole, Global models and the international economic order, Pergamon, 1977. John Richardson, "Global modelling - a survey and appraisal", Centre for Technology and Administration, 1977. Don Munton, "Global models, politics and the future", Annual meeting of the Canadian Political Science Association, 1978. Dick Lewdijk, World order studies - a comparative analysis, RIO Foundation, 1978.

[2] Meadows et. al. The Limits to Growth, Universe Books, 1972 Mesarovic and Pestel, Mankind at the turning point, Readers Digest/Dutton (both these studies were sponsored by the Club of Rome) Catastrophe or New Society? Fundacion Bariloche, IDRC, Ottawa, 1976. Leonteif et. al. The future of the world economy, sponsored by the United Nations.

Since there are significant differences between the results of the models and also a good deal of uncertainty in their projections it is useful to compare the assumptions and results of the models and to explore their implications for education. We consider, in turn, estimates of per capita income and regional economic growth, population levels, the sectoral composition of economies with levels of employment and the demand for different skill types.

III. Economic projections

The major output of the models which is most relevant to the normative concerns of their authors and which can be fairly readily compared (and which may have some relevance to forecasting future demand for education) is per capita income by region, and we begin by discussing this variable. Figure 1 (taken from Cole, 1977) shows per capita projections for the year 2000. The "Limits to Growth" model, although ultimately forecasting worldwide economic and demographic collapse, is by far the most optimistic up to the year 2000 (see Cole and Miles, 1978). The other models are each quite pessimistic in respect of Asia and Africa.

In the first instance these forecasts of per capita income depend upon projected gross regional product and upon population forecasts (discussed below). Regional gross product forecasts for the models are shown in Table 2. There are significant differences between the various models - this is especially true of the projections made for the South in the United Nations model (the reason for this is discussed below). Leurdijk (1978) gives an interesting comparison with the proposed target of the Group of 77 that 25 per cent of world production be located in the South by the year 2000. This is reproduced in Table 2.

Despite their differences, and at the risk of over-simplification, it may be said that the economic behaviour of the models rests on relatively few assumptions. Although they appear very detailed, existing models are in essence models of capital accumulation in which GDP growth rates are the product of investment and improvements in capital productivity. The models treat these variables in slightly different ways - in the United Nations model, for example, the investment required to generate a chosen rate of economic growth is calculated as an output of the model; in the "Limits to Growth" model capital is an input which is increasingly but futilely employed in raw material extraction.

The results of the models are especially sensitive to assumptions about levels of investments and technical change. This is easily seen if we assume that the models project approximately exponential trends up to the year 2000. The 'doubling times' of a sector or economy (i.e. the times taken for it to double in size) with a growth assumed at 1 per cent and 1.5 per cent and 2 per cent are 70 years, 47 years and 35 years respectively. Technical change assumptions which operate directly on productivity of capital in the models, therefore, are especially crucial. Assumptions about the direction of technical change are also central to questions of the demand for labour and for different types

Table 1. A summary of the underlying assumptions and findings of the global modelling studies

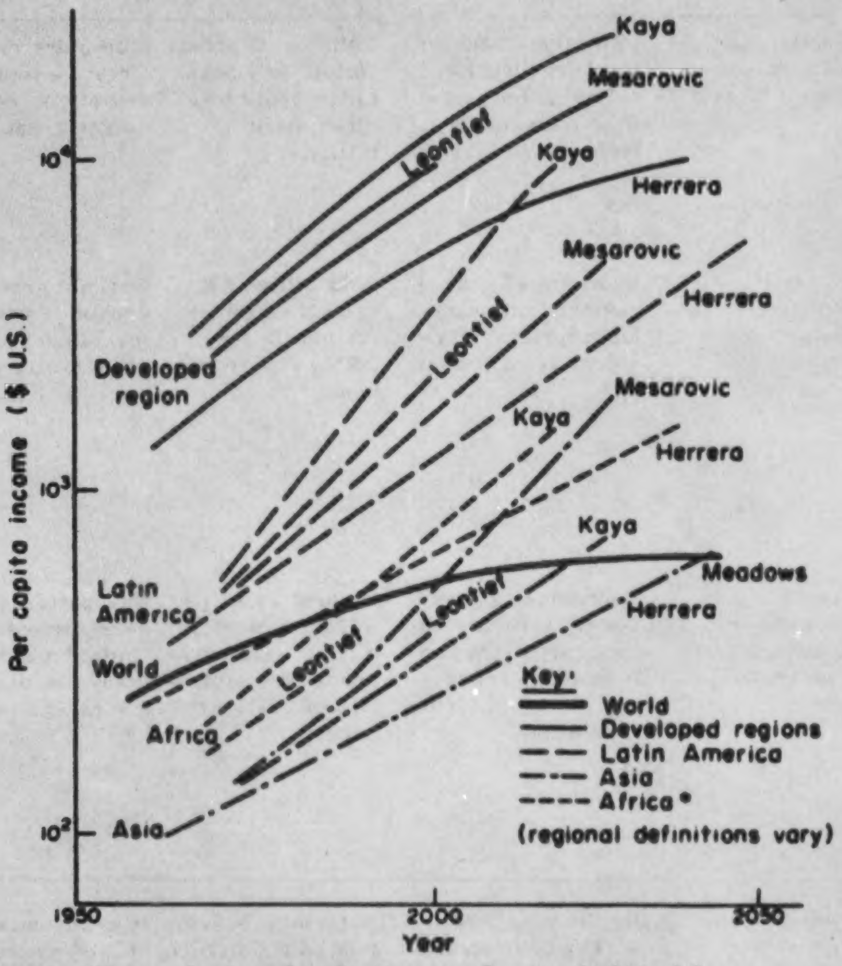
	Global forecasts and diagnoses	Food	Materials	Energy
The Limits to Growth (Meadows 1972)	Limits reached in next 100 years. Only safe way is to slow down - population growth is greatest impediment to redistribution - must achieve equilibrium or face oversheet and collapse.	Physical and social limit force collapse of agriculture in 100 years - 'law of increasing costs'	250 years supply only - collapse in 50 years through physical shortage and exponential growth	Needs ultimately adequately supplied by nuclear power
Strategy for Survival (Mesarovic and Pestel 1974)	Developing world crisis - regional resource catastrophes could spread world wide and paralyse future orderly developments. Survival of world system is in question - need technological restraint with social institutional and life-style reforms.	Possibilities for expansion of production are in rich countries but lack of production capacity especially in Asia.	Inexhaustibility cannot be taken for granted	Nuclear power is a 'Faustian bargain' - use solar power
Catastrophe or New Society? (Herrera et al 1976)	Catastrophe is an every-day reality in LDC's - extreme economic difficulty predicted in Asia and Africa by 2000. Scarcity is not due to physical limits - population growth is not the major factor - Must achieve basic needs in LDC's but without help this will not happen in a reasonable time.	Scarcity of LDC's not attributable to physical limits	Minerals can be extracted at decreasing social cost	Fossil fuels depleted in next 100 years - nuclear and fusion power is 'inexhaustible'
The Future of the World Economy (Leontief 1977)	Second development decade strategy does not provide for sufficiently rapid closing of income gap between developing and developed countries - gap would not diminish by the year 2000. Significant changes in economic relations between developed and developing countries - high growth rates in LDC's coupled with slightly lower rates in DC's are needed	Dramatic developments bring new land into production and double or treble yields.	Tremendous growth in consumption - not a problem of absolute scarcity - problem is how to exploit more costly resources	Coal is relatively plentiful even under conservative estimates.

A comparison of major long-term projection models
and their possible implications for education

Environment	Technology	Population	Economic and Institutional change
Exponential cost of pollution control cannot be met	Optimism about 'cost free' technology is not justified - blocks to technical progress	Collapse at about 16 billion - population could level off at about 6 billion	Stop industrial and population growth. Create a totally new form of human society in 'equilibrium'. This requires great moral resources.
Need to exist harmoniously with nature or nature will react against man	Exponential growth assumed although 'appropriate' technology is called for	8-12 billion by 2100 if an effective population policy is introduced	Organic growth co-ordinated global economic co-operation 5 per cent investment aid in LDC's. Create a conservationist global ethic and harmony with nature
Increasing economy does not necessarily mean increasing pollution	Technology grows faster than consumption - if LDC's had technology production would outstrip population	Highest 14 billion in 2050 lowest 10 billion - size depends on satisfaction of basic needs	New patterns of self-reliant socialist development worldwide we need with limited mutual aid. This requires fundamental socio-political reforms and an end to the ideology of growth
Technologically pollution is a manageable problem - economic costs high but not unmanageable	By the year 2000 developed countries other than the US will use the 1970 technologies of North America - other countries will move in this direction	Extremely steep rise in population - UN estimates used average about 10 billion	High investment and a brief expansion of international trade - significant changes in world economic order. Far-reaching changes of social, political and institutional character in developing countries not discussed.

Figure 1. Comparative regional growth per capita trends

(Regional income per head forecast by models if advocated strategies are implemented. Preliminary results from the Japanese Club of Rome study are included)



*No result given for the Strategy for Survival model.

Note : Comparisons are only approximate as the regional groupings of countries are slightly different for each study.

Source: S. Cole, Global models and the International Economic Order, Pergamon, 1977.

of skill (and hence also for education). Thus even relatively minor differences in assumptions about rates of investment and technical change which are well within the uncertainties in data (whatever other differences there may be in the structure of the historically observed magnitude of these variables) produce relatively large differences in projections of other economic variables over time scales of several decades. Differences in levels of investment (required to be as high as 40 per cent of gross product for some regions in the United Nations input-output model) have a similar impact on estimates of the rate of growth.

Several of the models are used to project economic trends into the middle of the next century. On this longer time span, the uncertainties in and differences between the models' results become very great. Indeed Table 3 shows estimates of per capita income trends for the year 2050.

Table 2. Regional gross product (based on Cole, 1977 and Leurdijk 1978) in Year 2000 (in billion $U.S. (1970)

Region	Strategy for survival	Bariloche	United Nations
North	8 907	8 160	10 170
West	6 941	-	7 239
East	1 966	-	2 931
South	2 038	2 539	4 348
Latin America	428	783	1 332
Asia	1 527	1 523	2 830
Africa	83	224	187
World	10 945	10 699	14 518
Ratio of South/World	.19	.24	.30

Table 3. Regional per capita income (billion $U.S. 1970) in 2050

	Asia	Africa	Latin America	North	World
Limits to growth	n.a.	n.a.	n.a.	n.a.	600
Strategy for survival	8 000	not given	10 000	17 000	4 000
Bariloche	980	3 400	8 200	1 300	2 000

If we accept for the moment the uncertainty in the projections of per capita income then some estimate of future educational demand might be extracted. In most of the models, as currently constructed, demand for different types of good (particularly agricultural products, manufactures and services) is assumed to increase as a function of per capita income. Thus, the pattern of consumption (in terms of expenditure as a proportion of total income) in Europe is assumed to tend towards that of the United States and that of developing countries to approach that of the currently developed countries. This is a common assumption in macro-economic models. The proportion of government expenditure (of which education is generally taken to be a part) is assumed also to vary in the same way or to remain at the historic level for each region.

There are, of course, many difficulties with such assumptions. The relationships, for example, are based usually on cross sectional national data and may have little relevance to the historical evolution of a given country. Nevertheless, in the spirit of such assumptions it might be possible to use the above projections to estimate future by assuming that as regional per capita income rises so, proportionately, will expenditure in primary, secondary, tertiary and continuing education. Figure 2 illustrates this tendency. Such an assumption would be consistent with other assumptions in the models and with the underlying theories of demand upon which they are based, in particular Engel's Law. Maslow's Hierarchy of Needs, Rostow's Stages of Growth theory, and different theories of post-industrial society.

However, as Table 4 shows, even for basic primary and secondary education this is at best only a very approximate rule of thumb and even at the global sub-regional level shown there are big deviations. These differences are further amplified at the national and subnational levels. For example, as Figure 2 shows, although by and large an increasing proportion of income is spent all on educational services (rising to from 6-8 per cent of GNP in Western and Eastern Europe (about 15 per cent of public expenditure) - and the proportion spent in the tertiary sector rises rapidly at the higher levels of income) there are substantial variations.

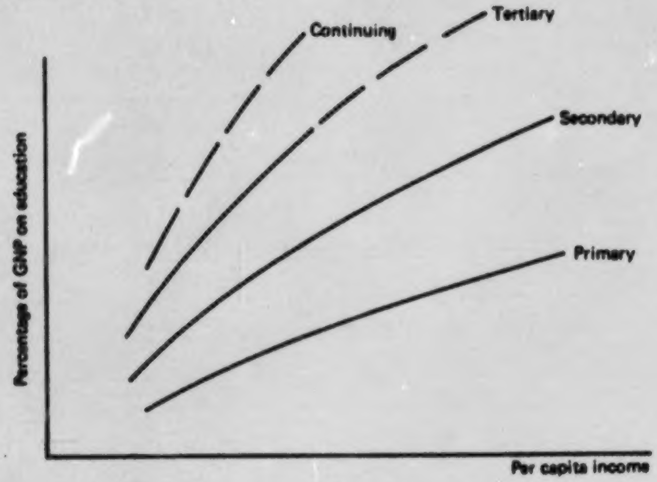


Figure 2. Possible assumed trend in per capita expenditure on primary, secondary and tertiary education

IV. Demographic projections

Population is a major variable - perhaps the major variable - in estimating future (general and primary) educational requirements. Demographic factors are treated somewhat differently in the various models. The United Nations study contains no demographic sector. For this model the aggregated forecasts of the U. N. Population Division are used: usually the 'medium' variant is taken although occasionally scenarios involving the low estimate are explored. Aggregated population figures are used to estimate demand for different goods (on the basis of GNP per capita projections). No account is taken of the age structure of populations. For the "Strategy for Survival" study a set of regional population models were constructed to explore demographic profiles (i. e. the age and sex structure), under different assumptions about the rate at which fertility would decline (as part of a 'demographic transition' to a world equilibrium population). Indeed, to achieve consistency in these results the authors say that it was necessary to have population divided into one year cohorts. Such work demonstrates the strong link between demographic structure and growth. In the "Limits to Growth" and "Latin American" models

Table 4. Per capita public income and primary and secondary education costs in selected developing regions

Region	GNP/Capita ($1974)	% GNP in Education Primary	Secondary
Europe (South)	1 567	1.4	.8
Africa (South)	1 197	1.7	1.9
Latin America (Med.)	1 031	1.5	.6
Middle East (Oil Producers)	908	1.6	.8
Latin America (Low)	745	1.5	.7
Africa (Arid)	353	2.1	1.5
Africa (Tropical)	270	2.2	1.3
Asia (including India)	187	.9	.9

Source: Based on Hopkins and Norbye, "Meeting Basic Needs - Some Global Estimates", Working Paper, ILO, Geneva, 1978.

it is assumed that economic and other variables endogenous to the model affected population growth. In the former, aggregated global 'birth' and 'death' rates are estimated from levels of per capita food supply, health expenditure, 'material standard of living' and levels of pollution. In the "Latin American" model age specific fertility and morbidity rates are assumed to depend on nutrition, health and education.

The global population growth trends used or generated by the models are shown in Figure 3 and a regional breakdown for the year 2000 is given in Table 5. Even for the North, where growth rates are assumed to be relatively small there are significant differences between the results of the various models. For the developing Southern regions the differences are considerable. Several authors acknowledge the very great uncertainty in their forecasts and, as noted above, propose variants. When population forecasts are projected further ahead the differences between them become even higher. Table 6 gives the regional breakdown of population for the year 2050. In this longer term context it is of interest to note that the global modelling studies considered here fall well within the very wide range of population forecasts considered in the 'futures' literature over the last decade. As Figure 4 shows, 'forecasts' for the year 2100 vary between 4 and 40 billion.

From the point of view of education policy, differences in the levels of population forecasts become especially important when it is realised that the variations arise largely from different assumptions about birth rates and hence the differences are largely of young people (i.e. people of educational age). Thus, for example, the difference of 134 million between the total population of Latin America

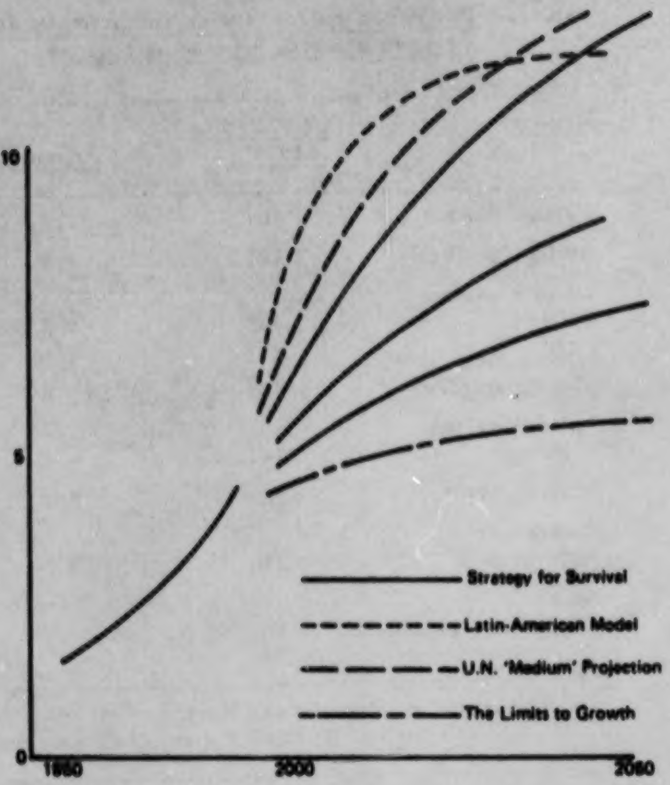


Figure 3. Global population growth trends provided by the studies

Table 5. Regional population estimates in the year 2000

Region	Limits to Growth	Strategy for Survival	Bariloche	United Nations
North	-	1 300	1 200	1 440
Latin America	-	600	500	620
Africa	-	500	700	640
Asia	-	3 500	4 000	3 700
World	6 000	5 900	6 450	6 400

Source: Taken from Cole and Miles in World Futures: The Great Debate, 1978

Table 6. Regional population estimates in the Year 2050

Region	Limits to Growth	Strategy for Survival	Bariloche	United Nations
North	-	1 300-1 700	1 200	-
Latin America	-	1 000-2 000	760	-
Africa	-	900-1 300	1 260	-
Asia	-	4 500-7 000	7 900	-
World	6 200 (equilibrium run)	8 000-12 000	11 120	-

Source: Taken from Cole and Miles in World Futures: The Great Debate, 1978

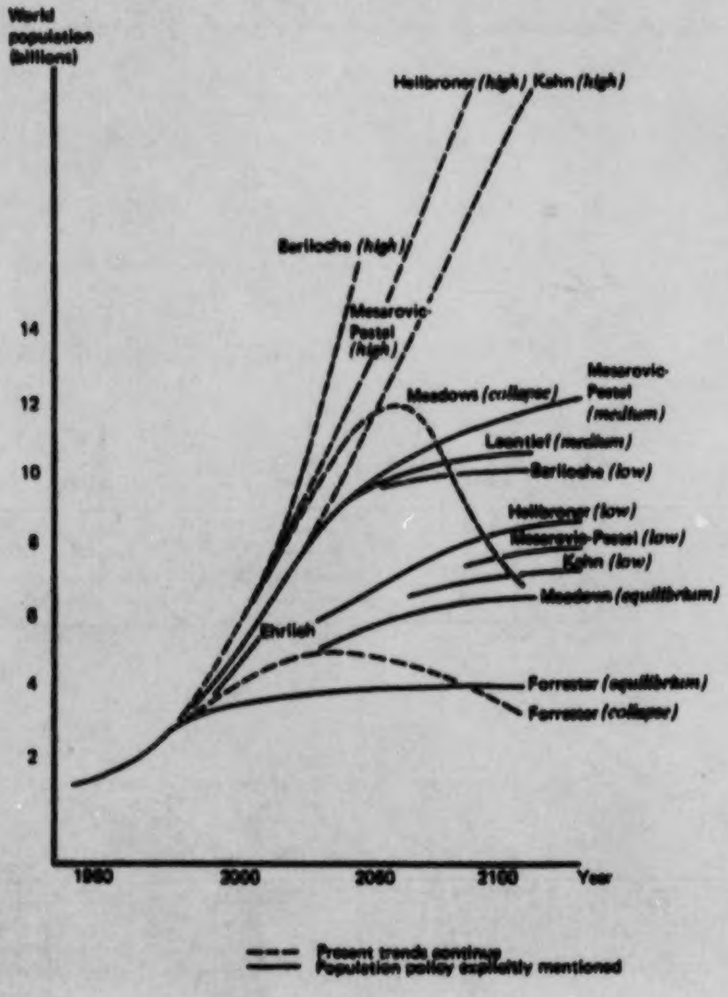


Figure 4. World population levels according to different authors (taken from World futures: The great debate)

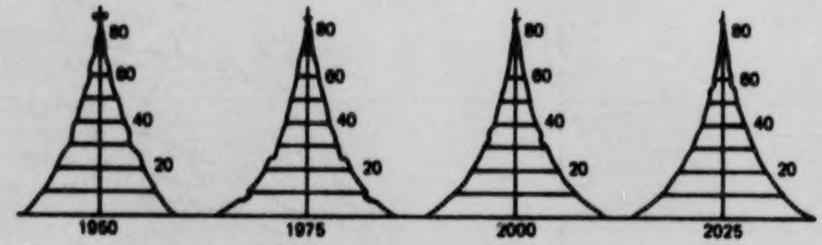
in the United Nations and Bariloche studies in the Year 2000 translates into a difference of 50 per cent in the estimates of young people (assuming that this group comprises half the population in that region). Similarly, the difference of approximately half a billion in the total forecast for the Asian region between the Bariloche and the "Strategy for Survival" model becomes a difference of 20-30 per cent in their estimates of young people. Furthermore, this represents only the difference between the central (most likely) estimates.

When different assumptions are made about changes in fertility (and morbidity) patterns the age profile changes dramatically. Figure 5 based on the "Strategy for Survival" results shows the change in the age structure of Latin America (taken to have a growth rate of 3 per cent per annum), for successive time periods when a 'population policy' designed to bring about 'equilibrium' is introduced. Here again the implied difference in demand for education is enormous.

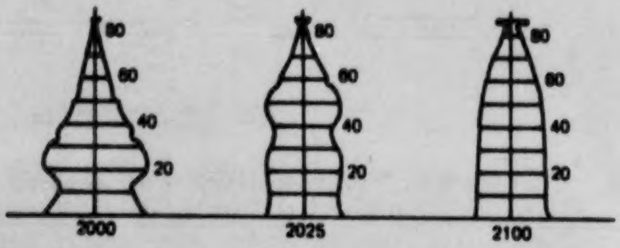
For Mesarovic and Pestel's projections for 10 regions of total population and their age structure profiles it is possible to make a rough calculation of the numbers of people in the 5 to 15 year age bracket under different assumptions about the demographic transition. Figure 6 shows total

Figure 5. Age structure and the demographic transition in Latin America

a) Age structure, assuming no change in fertility rates etc.



b) Age structure, development under an equilibrium policy



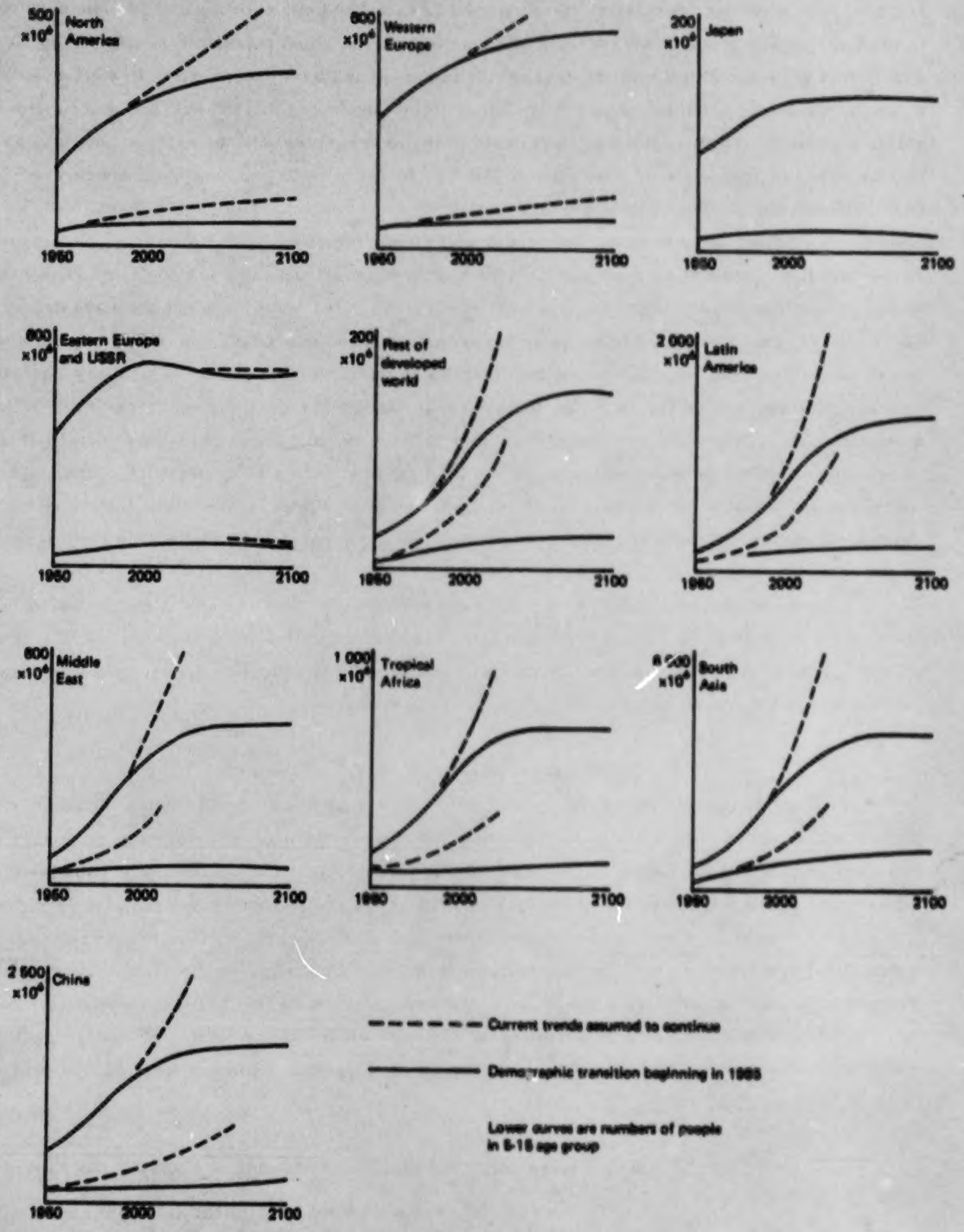


Figure 6. Total population and numbers in the 5-15 age group with and without a demographic transition

regional population (as forecast by Mesarovic and Pestel) and our estimates of the numbers of people in the 5 to 15 year group under two contrasting assumptions about population growth in the 10 regions. First, that growth will follow historical trends (as projected by Mesarovic and Pestel) and second that a demographic transition based on a 'population policy' beginning in 1985 will bring about more or less stable populations in all regions by the middle of the next century. In the calculations it is assumed that by 2050 the proportion of population in the 5 to 15 group is 13 per cent (i.e. roughly that in industrial nations today). The results are interesting for two reasons. They again indicate the very high level of uncertainty in estimate of the numbers of people of school age arising from uncertainty in future fertility rates and, second that provided an equilibrium tendency in population growth does become established the demand for educational services in the South does not increase dramatically above that *presently* required to bring universal primary and secondary education. Thus once this initial target has been reached the emphasis shifts to improving the quality of primary education and providing for successive levels. The demand for tertiary and continuing education would follow, with a lag, that for primary and secondary education. There is, of course, a problem here that the ability to provide a suitable primary education in the first place assumes an availability of trained teachers, who normally would be the product of the tertiary education sector[1]. A satisfactory model of the demand for different levels of training would have to take account of these various feedbacks and lags in the education process.

It should be noted that Figure 6 does not clearly show that already in some developed societies the rapid decline in birth rate in the last decade has meant that for several years there is likely to be a significant decline in the demand for primary and secondary education, possibly leading later to a fall in the numbers to be enrolled in higher forms of education.

V. The demand for skills

In the same spirit that we might look to population growth as providing estimates of the possible demand for education and to growth of domestic product for the possibilities of finding the necessary economic resources to satisfy that demand, the sectoral and technological composition of economies might be expected to give some indication of the type of skills required to run the system of production, and hence some indication of the demand for different levels of education. (This, of course, again takes a somewhat restricted view of the purpose of education). Depending on the balance between the various sectors of production we might expect quite different demands for skills. This demands some knowledge of the skill requirements of the different sectors now and in the future. It also begs the vital question of what is meant by a 'skill'[2]. In fact, in all the global studies in Table 1 this problem is

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1. See, for example, Whiston, 1978, *Education Policy - The Forecasting Dimension.*
2. See Acero, 'Social Change and the Acquisition of Skills', Working Paper, Project on Technology, Distribution and North-South Relations, Science Policy Research Unit, 1978.

circumvented by ignoring it[1]. In all models total undifferentiated labour requirements are calculated directly pro-rata against installed capital or through a Cobb-Douglas production function with limited capital/labour substitution[2].

As indicated earlier, the sectoral composition of economics by region is usually calculated in the models from demand for different types of goods in the region after allowance has been made for trade. Demand for the different goods in turn is calculated from per capita average regional income, assuming that the composition of future demand can be estimated from the historical experience of already industrialised countries. In fact it is assumed in the models that with regard to economic structure, choice of technology and patterns of consumption the developing countries will tend to follow the pattern of the Western mixed economies. Again only the Bariloche model contains a different set of assumptions. In that model production is oriented towards satisfaction of a given set of basic needs targets in health, food, shelter and education.

Comparison of sectoral projections in the models is especially difficult since the models all use different sectoral breakdowns which do not correspond to SITC classifications and different groups of countries in the regions. A comparison is given in Figure 7 for three models. The United Nations Model, for example, indicates a gradual trend of the 'Asian' region towards that of the 'North'. The Japanese Club of Rome, assume a much more rapid improvement in agricultural productivity after an initial period of high investment and a more rapid expansion of manufacturing while the Latin American group picture a more gradual trend. The differences are in part due to variations in the assumed pattern of international trade. Although, in the North differences between the projections are less apparent, as considered below, these macro-economic trends may disguise very large differences in both the demand for labour and the skill types required.

In fact the greatest uncertainties in the demand for different skills are likely to come from the difficulty in making definitive assumptions about future directions of technical change on aggregate or in specific sectors. The uncertainties arising in, for example, trends in labour productivity by different skill groups are likely to be very large; consequently even given some rough agreement of the relative size of sectors there may still be considerable disagreement in the demand for labour and for skill types. But more importantly, if we make some assumptions about current levels of

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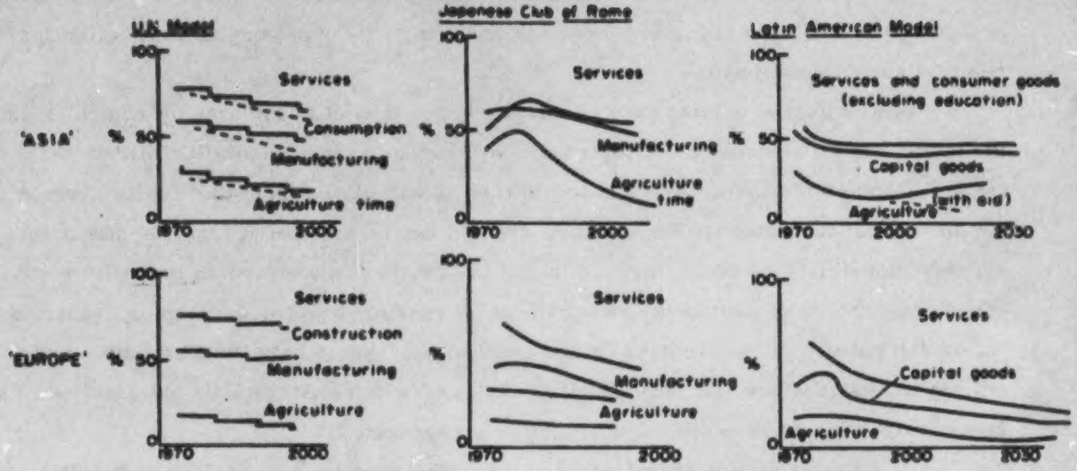
[1] In some cases the situation is more confusing. For example, the capital-output ratios assumed by Mesarovic and Pestel in all runs of their model imply a trend to capital intensive methods, even though the authors argue for (labour intensive) intermediate technology.

[2] In some scenarios explored using the United Nations model total demand for labour calculated using this method exceeds the supply estimated from the assumption about population growth. Stern, Working Paper, ILO, Population Division, 1976.

Figure 7. Composition of regional economies



Source: S. Cole. "Global models and the International Economic Order", 1977

Note: Sectoral divisions are not strictly comparable as different definitions are used in each model. For the Latin American model the 'developed' regions are shown. The results for the UN model are calculated for ten year periods.

labour productivity for different skill types and combine these with the assumptions about growth rates of GNP and technical change used in the global models the results appear to present certain problems.

We may illustrate this difference using the results of Figure 7 and data used in the calibration of a model of North-South relations[1].

Table 7 shows the changes in the total demand for skilled and unskilled labour if it is assumed that in the quarter century up to the year 2000 per capita income in Southern countries will increase by a factor of four, total population by a factor of two and in the same period the technology used in those countries is similar to that currently used in the North (this is the basic assumption used in the United Nations study). On this basis proportions and productivity of different types of labour employed in the South in the year 2000 would compare to those of the North in 1975. While making these assumptions (see Table 7), not surprisingly, implies a rapid increase in the demand for skilled labour (and hence certain types of education), it also implies a much greater displacement of unskilled labour

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[1] See 'The Calibration of a Model of North-South Economic Relations,' Clark, Cole and Lucas, Applied Mathematical Modelling (to be published) 1978. This calibration was based on Brazil (1959) for the South and the United Kingdom (1968) for the North. The sectors in this model, specified by Chichilnisky and Cole (see p. 18), are 'basic', 'non-basic' consumption goods and 'capital' goods, each employing different proportions of 'skilled' and 'unskilled' labour. While there are tremendous problems of achieving consistent (or even comparable) definitions of good and labour types the data used in the model shows clear regional differences across sectors. Typically, but depending on the sector considered, in the South the proportion of skilled labour is several times lower than in the North (a factor of 2) and the proportion of 'unskilled' labour considerably higher (a factor of 20). Labour productivity ratios differ correspondingly.

(with a correspondingly high level of unemployment, especially when population growth is taken into account)[1].

Varying the assumptions about growth in income, productivity and population will clearly have a large impact upon the results. Extrapolations of income and productivity growth for industrialised countries lead to similar, but slightly less alarming trends in unemployment. A fundamental conflict between social and economic objectives is posed which has led, for example, to repeated calls for more appropriate (and often more labour intensive) production techniques in developing countries. To the extent that more suitable techniques of production may be sector specific (e. g. labour intensive in the rural sector, more capital intensive in the urban sector) the breakdown of overall economic change at a detailed sectoral level (within the limits of uncertainty indicated above) could provide useful information on different skill requirements.

Table 7. Possible requirements for skilled and unskilled labour under selected assumptions about GNP and Productivity Growth

	1975	2000	2000/1975
GNP(1)			
Labour inputs(1)	100	800	(x8)
Unskilled	98	13	(x1/8)
Skilled	2	26	(x16)
Total Employed	100	39	(x1/2.5)

(1) Measured in appropriate units

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[1] The sensitivity of such results to the input assumptions is very great. However, OECD, the World Bank and ILO forecasts are equally pessimistic. OECD estimate a 30-35 per cent growth rate is required to eradicate unemployment in the next decade. An 18 per cent growth rate would be required simply to cope with the current 3 per cent increase in labour supply.

VI. International exchanges

Assumption about trade in the models are less critical to the results than those about either levels of investment or technical change even though they are important components of the global development strategies posited by the authors of the United Nations study and the"Strategy for Survival" model[1]. They affect to some degree the rates of economic growth projected by the models but in the context of a discussion of education are relevant because of their implications for international transfers of knowledge and cultural styles.

In all models except the Latin American model it is assumed that trade is beneficial to the growth of both the North and the South and their authors advocate a more globally integrated path of development[2]. This and the other assumptions indicated earlier implies considerable (but unquantified) levels of transfer of technology, patterns of consumption, expert advisors, academics, etc. The Latin American authors are sceptical of this assumption and prefer a more antarkic path of development and, therefore, attempt to reduce international transfers and, in particular, to phase out foreign investment.

Estimates of international transfers are shown in Table 8. For want of better indicators of international interdependence they provide some idea of the level of inter-regional transfers of social, cultural and other aspects of development and hence have some importance for the consideration of educational needs.

Table 8. Levels of trade projected by the models in the Year 2000

	Bariloche Inter-regional trade - (billions dollars)	United Nations % Share of World Exports
North	29	77
Latin America	24	4.6
Africa	9	13
Asia	37	

The apparent differences between the two models in Table 8 arise because the United Nations estimates include intra-regional trade which is especially high for the Northern economic bloc. Contrariwise, most trade for the Southern regions is with the North.

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1. However, although it is not made clear in the studies, rates of investment and technical change would undoubtedly be related to levels of trade in the scenarios they envisage.
2. It is therefore assumed in the models that not only are there economies of scale to be enjoyed through expanding the international market, but that this will operate to the benefit of all parties. It is often argued by economists from the South that developing economies with unequal income distribution and an inhomogenous system of production attempting export led growth are likely to suffer worsening income distribution, terms of trade and receipts: see for example, Chichilnisky 'Terms of Trade and Domestic Distribution: Export Led Growth with Abundant Labour', paper 41, Harvard Institute for International Development, July 1978. Also 'Growth of the North and of the South with Export Led Growth', Development Discussion Paper, 1978.

VII. Educational styles

So far we have dealt with the question of to what extent global models may contribute to an understanding of the likely demand for educational services, largely on the assumption that this demand can be fairly directly related to the demographic and macro-economic output of the models. This approach has allowed us to avoid many questions of the purpose and manner of provision of those services, except the relevance of the various outputs to demand for different types of education. Here we begin to explore how ideas about education might be used to modify the inputs to the models.

Images of what education does at present and could do in the future are, of course, closely related to many other variables including for example, the relationship between work and leisure or preservation or reform of social and economic structures. Current systems of education may be regarded largely as vocational training, socialisation of children into different rôles or social classes, a 'childminding' service for rearing the unskilled workers of the future, a means of disguising unemployment and damping down social conflict, a system for the reproduction of ideologies, a form of conspicuous intellectual consumption for the middle classes or a medium for personal development and the expansion of people's aspirations, commitments and skills, and so on. Whichever of those, or combination of them, is employed, would dramatically affect any quantitative estimates concerning, say, the resource demands for education, but would even more affect the qualitative inputs to the system[1].

The choice of goals for a given system of education is, however, perhaps not quite as wide as indicated by the arbitrary list above, since certain combinations would be to some extent contradictory. For purposes of discussion here we could consider constructing 'packages' of education systems fitting to different conditions of economic growth and to different images of the rôle of education. For example, Table 9 indicates very schematically three alternative images of future patterns of education in Northern and Southern societies assuming relatively high levels of economic growth and a tendency for populations to level off in both regions.

The first entry in this table reflects the views of those people who on the whole advocate disciplines reminiscent of the traditional classroom, training children in values and competencies seen as necessary for industrial society. Nevertheless they do not reject the use of more economically efficient teaching aids. The second entry reflects the views of those who incline to more experiment and diversity in education, with for example, community based schools and training. The last entry reflects opinions that while curricula should be harmonised with planned social development the education system should be responsive to the needs expressed by those engaged in learning.

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[1] Quantifiable or not, tremendous problems of definition arise at all levels. These are avoided, wherever possible, in this paper. For definitions of traditional measures see, for example, the UNESCO Statistical Handbook

Table 9. Summary of three contrasting approaches to educational policy in North and South societies assuming relatively high economic growth

	North	South
Traditional	Education largely utilitarian and function oriented, but also partly for leisure. Also programmed computer learning techniques as well as traditional classes. Adults retrained according to the demands of technical change.	Education largely based on Northern systems using imported packages of materials, satellite beaming of educational television and North trained experts in colleges and universities.
Diverse	Education designed to create generalist, liberal intellectuals, creative artists and craftsmen. Lifelong education using diverse techniques.	Education more functionally oriented than in the North towards engineering, medicine and entrepreneurial skills
Progressive	Education towards training for basic skills but emphasis on personal development and creation of collectivist attitudes.	Education towards practical basic skills with much 'on site' training using available materials.

Note: This table is based on Table 9. 12 in Miles, Cole and Gershuny 'Images of the Future' and Freeman and Jahoda 'World Futures - the Great Debate 1978'

In terms of the model results considered earlier in order to quantify the first scenario, information relating to demand for future production skills would be most relevant, while information and per capita income data would be more emphasised in evaluating the second and third scenarios.

The three sketches are seen to be consistent with very different attitudes to future educational development and, indeed, to development as a whole. These images of education systems thus correspond to total images of development embodying contrasting ideological standpoints[1]. The first, for example, clearly is consistent with a global economic development in which there are increasing levels of trade, increasing international homogeneity of consumption and technology, and a world in which distribution of income services is correlated with effort and ability. The last is more consistent with images of radical and political change, in which redistribution of social and economic welfare at the domestic level is emphasised. Since all the models described above treat income on a regionally aggregated basis no information relevant to the explication of possible dynamic inter-relationships between economic and educational distribution are available from the models. (This issue is taken up again later). In the main, global modelling studies implicitly assume some combination of the first two of these alternatives although the ideological underpinnings of most modelling studies are treated, to say the least, discreetly. In fact predominantly the goals speculation about and directions set for the future in modelling and future studies, even when focussing on problems of Southern countries reflect, at both the domestic and international level, a Northern liberal perspective (with the exception of the Bariloche study).

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[1] In World Futures: The Great Debate contrasting images of 17 areas of social and political development are sketched in an attempt to 'flesh out' scenarios produced from alternative assumptions about economic trends. (See also, Futures, Vol. 10, No. 1, 1978, 'Scenarios of World Development'.

Essentially, and again at risk of over-simplification, the image presented in most modelling studies embodies the idea of 'post industrial' society (in the sense of Herman Kahn in 'The Year 2000' or Daniel Bell in 'The Coming of Post-Industrial Society'), with the focus of economic activity on due provision or consumption of services (particularly educational services). While this assumption is of direct importance for the trends suggested for Northern societies it is also, because of the implied assumption in these models that trends in the South will follow the North (through 'modernisation', demonstration effects, technology transfer etc.) important for the South. It has to be questioned therefore to what extent this image of post-industrial society holds good[1], especially as the educational 'requirements' of the different economic systems may differ considerably from those of the traditionally held view of post-industrial society.

The 'Limits to Growth' modellers apart, most global modellers take a relatively optimistic view of possibilities (providing their economic prescriptions are adhered to). While it is not necessary to dwell on more dismal profiles of economic growth there are many people in the world today who subscribe to them and again alternative education scenarios may be derived. Table 10 indicates how the same schools of thought (noted above) might expect the education system to survive in a less optimistic worldwide situation of economic growth. Here, especially it is clear in each case that the reason for economic decline is in part attributed to a failure of the system of education as well as the reverse. In these 'low growth' scenarios education may well be more closely linked to economic fortunes than in those assuming higher growth.

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[1] In fact even for Northern Societies this view of 'post-industrial society' may be seriously questioned in the terms it is usually presented and implied in the models - see especially Gershuny After Industrial Society, MacMillan 1978. Technological advances in all branches of services, as in other sectors, may mean that expansion of this sector will not replace the employment lost from others, labour displaced by automation, for example, is unlikely to be compensated for by the process of automation. Gershuny has postulated the emergence of a 'dual' Northern economy - a formal economy largely based on the production of material goods, increasingly demanding of technical skills. This would create a situation not unlike that considered for Southern countries earlier, and for similar reasons.

Table 10. Summary of three contrasting pessimistic and optimistic views of education, assuming relatively low economic growth in both North and South

	North	South
Social Decay	At worst, progressive education and social decay have led to anarchic conditions in which only apathy can be learnt. At best, authoritarian conventional systems but facilities ageing and in disrepair.	Schooling sporadic and unfocussed except for relatively small elites with essentially a custodial function. Tendency for children of the wealthy to be educated in the North. More optimistically, basic education might be imported through powerful cheap technology for efficient dissemination of skills.
Remedial	The purpose of education becomes one of desperately trying to clear up cultural disasters of economic depression. Severe shortage of vital funds. An optimistic alternative might be a society adapted to economic constraint and oriented towards training in crafts, an appreciation of ecology, etc.	At worst, very similar to the above view. More optimistically, education oriented to primary schooling functionally oriented but with only rudimentary higher education for elites, or even 'deschooling' as part of a wider programme of social reforms.
Custodial	Education has a custodial function, with emphasis on militarism and discipline and a decidedly practical bias. With wider reforms in education towards creation of skills and collectivist attitudes	Much variation with custodial schooling and indoctrination for the masses and technical training only for elites. If political change occurs more practical orientation with a strong emphasis on building social consciousness.

If regions of the world are stagnant, this implies real and disguised unemployment; if they are in severe recession or cycles of boom and slump, job security is likely to be low and again unemployment high. Either is likely to have severe ramifications for both people's willingness to make use of educational opportunities (if they are offered) and the ability of the State to provide them. To what extent may such factors be accounted for in existing models?

Some aspects of these different scenarios might be explored in existing models, for example the resource demands arising from different techniques and educational technologies. In some scenarios lifelong continuing (part-time) education might be concomitant of rapid economic growth in Northern and Southern societies, introduced in some cases for necessary occupational training and in others for voluntary personal development. In a wealthy industrial society 'high' technologies in education might include computer assisted learning systems, video-taped recording of classes, automatic devices to make learning more attractive. It is easy to see the kind of quantified adjustments that should be made to the parameters in a model to account for such developments. Lifelong periodic education would result in a smaller potential work force, although probably more highly trained and more productive. Thus labour supply and labour output coefficients would be affected in relevant sectors. As the education (or service) sector becomes more capital intensive, fewer but more highly trained teachers would be required. Thus both capital and labour coefficients should be changed.

In developing countries mass education might use high-technology communication systems (e. g., educational satellites) for large and scattered populations in a world of otherwise high economic growth[1]. Again, this might be associated with constant requirements for education about immediate practicabilities of crop production or small-scale industrial development. This would require similar adjustments to the model parameters to those described above.

Alternatively education 'in the field' may be considered far more relevant to building the strong agricultural and industrial base needed for self-reliant development in Southern countries than to mimic the formalised and structured education systems of the North. Learning materials and situations in this case would be those immediately available and relevant to economic and social skill acquisition. Thus, in this case, an appropriate adjustment to the model might be to lower labour productivity temporarily or permanently in those sectors in which training was to take place (for example, by introducing a 'learning curve' into the model), while at the same time reducing inputs to the formal education sector. In principle, therefore, relatively simple changes to the models allow alternatives to be evaluated in a limited way in terms of their output, i. e. effectiveness in fostering deserved social and economic development goals and in terms of their inputs, e. g. demand for school building and equipment, teachers, retraining facilities, etc., although it is an open question whether the numbers emerging from such analyses would be reliable for purposes of policy.

Clearly by ringing the changes on such scenarios and variables very different estimates of demand for educational resources may be arrived at. This does not of course mean that it is not possible to go some way towards useful estimates in the context of global modelling exercises or to exclude a formal education sector in a global model. Indeed, for their own purposes (described below) the Bariloche group did exactly that. But whichever approach is adopted it is first necessary to have a clear and spelled out image of the system of education proposed and its linkages with the rest of the economic system. The kind of extrapolative numerical exercise engaged in earlier therefore produces, at best, only an initial rough guide.

VIII. An example: education for basic needs

With the exception of the Latin American model 'education' as such is given no special treatment in the models and is included only as part of the service or government sector. These sectors are typically assumed to consume a fixed proportion of total income. With current formulations, even if the education sector was identified, it would appear only as a consumer of resources and would have no feedback to the rest of the economy. Thus a policy of increased expenditure on education could show no positive impact on economic growth; in fact the reverse, since the additional investment would be subtracted from that going to the production sectors. Nevertheless as indicated above, with certain modifications to the models, even without the explicit introduction of an education sector it might be possible to go some way towards exploring slight modifications to the scenarios considered in terms of the consequences of an implications for changes in the system of education simply by making judicious changes to the model parameters. It should be stressed however that a certain coherence in theoretical assumptions has to be retained throughout the model when such changes are made.

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[1] Krishnaya (An Outlook for India's Future - Interim Report on Communications, Department of Science and Technology 1976) has made an analysis based on Indian experience which raises similar questions to those posed by Gershuny and others. He envisages the 'most likely future' as presently emerging one of a knowledge based bureaucratic society dominated by urban complexes. In particular, from the point of view of education, the one way character of mass media creates a 'Pavlovian Syndrome' and passivity in people. To avoid this trap he sees the need to engage in a compensatory effort to vitalise, particularly, rural areas (using a broad spectrum of communication devices), multi-media communication centres for technical learning, and support for traditional cultural forms.

Unlike other models the "Latin American" model makes direct and indirect links between education and population growth. First as considered earlier, population growth leads directly to the demand for educational services and second education is assumed to contribute to a reduction in fertility rates.

In the "Latin American" model education is represented as a separate sector. The authors emphasise the fundamental importance of education for the attainment of the society they desire, and also a continuing basic requirement once such a society has been achieved. Education is visualised as an instrument of social change and, if all individuals are to participate in producing change, then they must receive permanent education particularly when change is broad and rapid[1]. Given this 'non-traditional' image of education it is well to understand the treatment of the education sector in the model.

In fact, the explicit treatment in the model is restricted to an account of 'organised formal training'. In the model, expenditure is allocated to four levels of education: - 'basic' (to cover 98 per cent of the population from age six for a period of 8 to 12 years); 'middle or high level' education oriented to the training of a critical mass of middle and higher staff (assumed to cover 7 per cent to middle level and 2 per cent for higher level to equip a certain proportion of the population for specific economic, social and political tasks as well as for autonomous and self-sustained scientific, technological and cultural development); 'continuing education' (periodic education occupying about 10 per cent of the time from ages 20 to 50) and compensatory education to cover adults who because of current social deficiencies are wholly or partly illiterate.

The education sub-model[2] is specified by assuming an initial registration rate and cost of education per student based on existing 1960 data. The estimated requirements for education at each

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1. Like all cliches of the international development debate the term 'basic needs' has been used to cover a wide range of alternatives. Carr Hill in Education and Basic Needs: Views on Concepts and Measurement seeks to clarify this confusion.
2. See Catastrophe or a New Society, page 81; The Latin American World Model - The Education Sector, UNESCO 1977.

level in the four regions considered in the model are based on UNESCO estimates of current educational standards[1]. From these figures and more detailed evaluation of educational costs the authors were able to estimate total economic and other inputs to the sector. From 1960, given capital and labour availability for the sector total investment in education can be calculated. By assuming a new average cost of educating each student the number of places is found. Then, taking the population in the 6-18 age group (from the demographic model) the registration rate is recalculated. This procedure is elaborated in Figure 8. Because in the study education is empirically observed to have a positive correlation with life expectancy and because the optimisation procedure used in the model to achieve basic needs targets allocates investment so as to maximise the increase in life expectancy each year, expenditure on education per student steadily increases (in the Southern regions). When the registration rate reaches 98 per cent the cost per student is increased by 2 per cent each year until a maximum of US $150 per annum is reached. This figure can be modified but is considered large enough to achieve a quality of education similar to those in the advanced countries. (Similarly when basic needs in nutrition, health, shelter are reached levels of investment are adjusted to ensure that welfare of the society continues at the required level).

The trends projected by the model from the 1960 base are shown in Figure 9. From the earlier discussion on the demographic projections of the models it may be seen that the tendency of total educational inputs to level off after the year 2000 once basic needs have been met is largely due to the demographic transition which takes place (in part as a result of earlier increased expenditure in education).

The treatment of education in the "Latin American" model has several merits, in particular that the authors have tried to make their assumptions about education consistent with other aspects of the path of development they propose. Nevertheless, there are obviously many limitations, some of which the authors acknowledge and are working to improve[2]. Given the uncertainty in the costs of provision and resource inputs to the education sector to achieve a given standard (i.e. inputs do not equal outputs) some exploration of the effect of alternative assumptions is needed.

Although in the model educational achievement is divided into several categories which may be assumed to relate to skills required in the production sectors, the production functions used do

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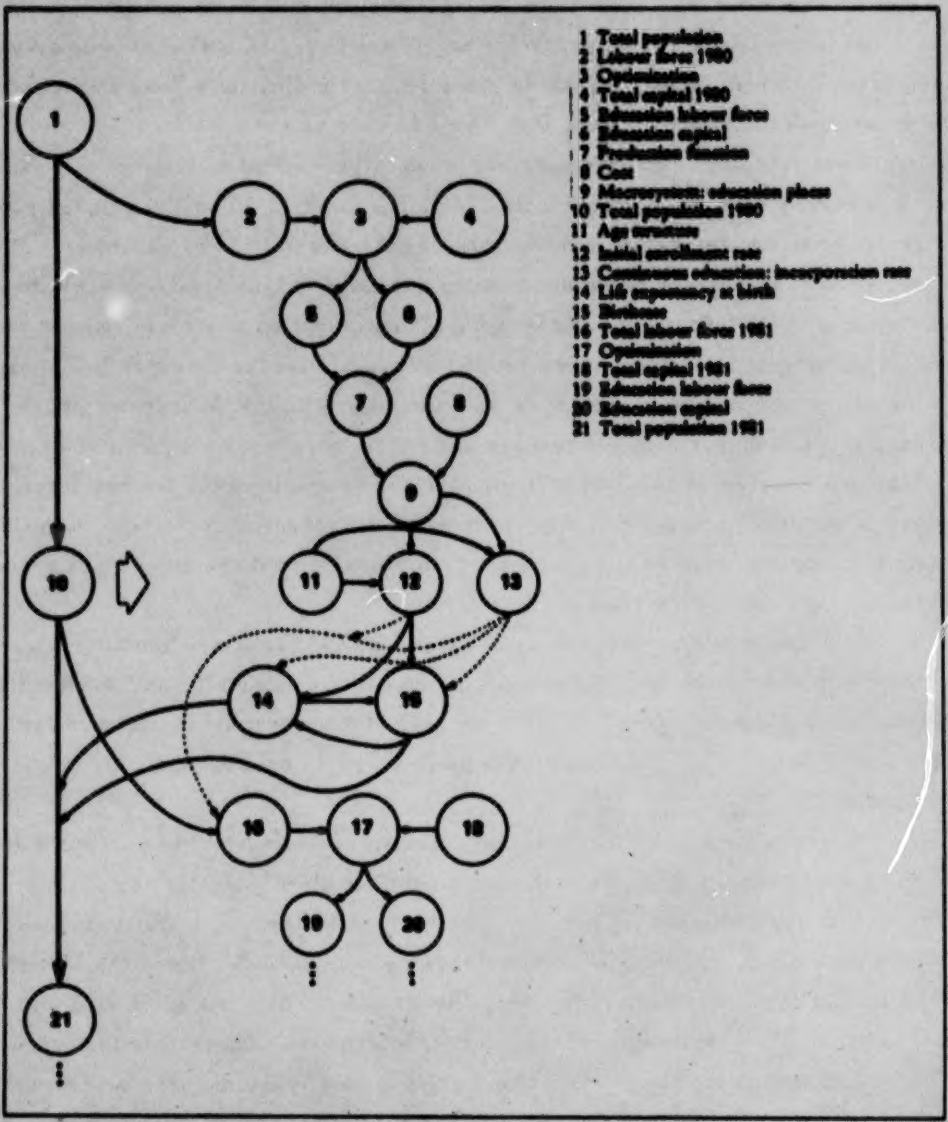
1. The data used shows that while in the advanced countries there is universal primary education, on average in the less developed regions of Latin America, Africa and Asia the figures are 75 per cent, 40 per cent and 55 per cent respectively with large variations between countries in each region. Further it was found that in 1970 nearly one third of total world population was illiterate (24 per cent, 71 per cent and 47 per cent in Latin America, Africa and Asia respectively).
2. For example, the effect of education on the participation rate of the labour force.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1 Total population
2 Labour force 1980
3 Optimisation
4 Total capital 1980
5 Education labour force
6 Education capital
7 Production function
8 Cost
9 Macrosystem: education places
10 Total population 1980
11 Age structure
12 Initial enrollment rate
13 Continuous education: incorporation rate
14 Life expectancy at birth
15 Births
16 Total labour force 1981
17 Optimisation
18 Total capital 1981
19 Education labour force
20 Education capital
21 Total population 1981

Figure 8. Operation of the education sector in the Latin American Model during optimisation of basic needs (life expectancy)
Source: Catastrophe or new society? p. 78.

not distinguish different labour types. Therefore it is not possible to account explicitly in the model for changes in the composition of skills (or feedback from the education sector as the availability of skilled labour increases.) Some approximation to this could be achieved however by enlightened adjustment of the labour/capital proportions.

Perhaps more importantly is that the model is designed only to demonstrate the viability of an 'ideal' society rather than to demonstrate how a transition from current society to that ideal may be brought about. Thus, a perfectly egalitarian distribution of basic goods (including education) is assumed at the outset. Consequently important dynamic relationships for the scenarios considered in the last section between the distribution of economic and educational resources are not accounted for. We take up this issue in the final section.

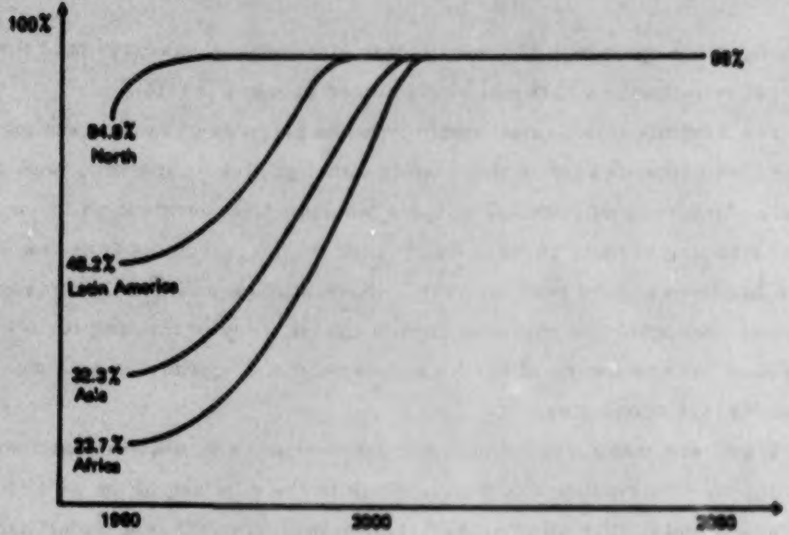

Figure 9. Future trends in enrolment in basic education according to the Latin American World Model

IX. Conclusion: structural and dynamic relationships

The omission of income distribution questions (at an intra-regional level) and dynamic effects related to the building up through time of a satisfactory system of education is especially important. The significance of the mismatch in time between the requirements of skilled labour inputs and outputs was commented on in Section III. The significance of different assumptions here is illustrated by experimental alternative runs of the Bariloche model (reported in Catastrophe or New Society?) in which a continuation of historic income distribution patterns is assumed for all regions instead of the perfectly egalitarian allocation of basic consumption goods. In this case the minimum period required to attain basic needs targets is extended by a factor of three. Furthermore the annual and total resources per capita consumed in order to reach the growth targets are increased several fold.

At least as important, however, are the dynamic inter-relationships between income distribution and other variables included in the models. In market (and non-market) economies income distribution is related to the direction of technical change (through relative factor prices) and hence to the demand for skills[1]. Similarly there is a strong linking of income distribution with economic growth through the operation of domestic and international markets (and through many other social and political relationships between world actors at many levels).

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[1] There are of course already several single region models which provide a more detailed breakdown of domestic economies with some account taken of income distribution. The Bacchue Employment and Population model for the Philippines, for example, treats separate labour markets for a large number of skill groups in both urban and rural sectors. The distribution of income between labour classes is assumed to depend on the employment characteristics of different technologies, which in turn are fixed as given by input/output tables. Some substitution between skill types is admitted through the use of generalised Cobb-Douglas production functions. Other models, e. g. the Adlerman and Robinson study of Korea assumes again a very large number of skill groups and a market for labour with up to 500 wages rates for different 6 skills and 29 sectors.

The dynamic inter-relationship between patterns of income distribution and education are, in particular, not accounted for in the models although clearly they are implicit in the theory propounded by the Latin American authors. The cycle whereby the education children receive is linked to income and social standing of their parents and in turn the income and social standing they achieve is related to income has been argued persuasively[1]. Such studies indicate that this is a very significant feedback which cannot reasonably be excluded from a useful study of the long term development of the education system and an understanding of how to achieve a more egalitarian society. This applies in Socialist as well as market economies.

There are many other direct and indirect ways in which educational requirements may be linked to income distribution and which relate to the question of the effectiveness of education expenditure. For example, it is often argued that malnourishment is a major handicap to children's learning ability just as it affects the productivity of other workers. But while the models usually have fairly detailed descriptions of the supply side for the food sector because they neglect the means of distribution they provide an inadequate description of the consumption side. Further given the inter-relatedness of supply and demand for agricultural products especially in developing countries this reduces the worth of the detail on the supply side, even for the forecasting of demographic trends.

It has to be recognised that these limitations referred to above are not easily overcome. Given the lack of reliable data for many important variables and the technical and theoretical difficulties in constructing viable large scale models always some balance has to be struck and this is bound to be unsatisfactory in some respects[2].

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[1] For example, by Bourdieu and Passeron in Reproduction in Education, Society and Culture and Feinberg in Educational Equality under two Models of Educational Development. Much supporting data is to be found in Europe 2000 - Educating Man for the 21st Century and in various general household surveys.

[2] The present author is engaged in a project which models simultaneously income distribution factors, demand for skills and effects of international markets. For the macro-economic modelling the approach here has been to keep the sectoral aggregation high and to use this model to explore the fundamental behaviour of the economic system represented. More detailed studies of selected issues are carried out using more detailed sub-models and by working through selected case studies. Given the fact that however disaggregated a macro-economic model one constructs, the level of description is likely to be too coarse to be directly relevant to policy - this seems a plausible approach. (Technology, Domestic Distributions and North-South Relations - A Progress Report, UNITAR Project on the Future, New York, 1978).

While it has not been the purpose of this paper to develop an 'alternative' model of education it is useful to take an example. Indeed, as suggested earlier, there are several alternatives to those implicit in current global models. It may be worthwhile, in particular, to speculate about a framework around which some of the reproductive and reinforcing effects of social and economic markets might be traced. For example, an important question to study is the pattern of demand for 'workplace' skills in countries presently undergoing industrialisation if those countries are to become less technologically dependent on the countries of the North. For economic reasons not expanded upon here it might be argued that this involves a partial delinking of the Southern economies from those of the North, based on the creation of a substantial Southern market for goods produced in the South. It may be further argued that this is consistent both with the creation of higher skills in the South and also with a more egalitarian pattern of distribution. Left to the market these two requirements might in themselves be inconsistent. It is important to know to what extent such a contradiction could arise and how best to deal with it and in particular, from the perspective of the present paper, to know for example what would be the minimum changes needed in the reproductive educational and economic cycle referred to above in association with other policies if the desired pattern of development is to be achieved.

An outline of a programmable model which might be used to explore this question is indicated in Figure 10. Central to the model is the idea of different skills involved in different modes of production and innovation, the development of the demographic and educational sector. Since the demand for luxury products and Northern goods are also the outcome of the 'socialisation' of the marketplace (i. e. advertising and cultural demonstration effects) such variables, which form part of the informal educational system, have to be accounted for. Other aspects of education and the demographic sector, noted earlier, are omitted and clearly such a model raises many issues of definition which are not confronted here. The model sketched in Figure 10 is intended only to show the direction in which functional models of education might move and the simplified level of discussion at which one is probably ultimately obliged to work.

What becomes clear from this brief review is that in principle global models might be used to produce 'data' useful as guidelines to some aspects of educational policy. But even if all the problems mentioned above were dealt with it has to be recognised that tremendous uncertainties in any quantitative estimates would remain and that this uncertainty must be dealt with in the creation of sufficiently flexible policy! Although the results of the models help to draw attention to potential contradictions in education and other social and economic policy, at present they have only a rather limited contribution to make. In part this is because they have not been designed with the requirements of education policy in mind and consequently having little specific to say.

It is not so much a matter, in the first instance, of finding valuable the output from the models for purposes of estimating educational resource requirements. Rather, what is required, if the models are to be useful is a much greater input from persons connected with the educational establishment. While this is an easy statement to make in a seminar with this audience, it also happens to be true, and would be for consideration of any other dimension. What is also clear, and is probably more true of education than any other dimension to be studied is the complex set of relations between the quantified macro-economic and demographic variables the models do consider and the very many less easily

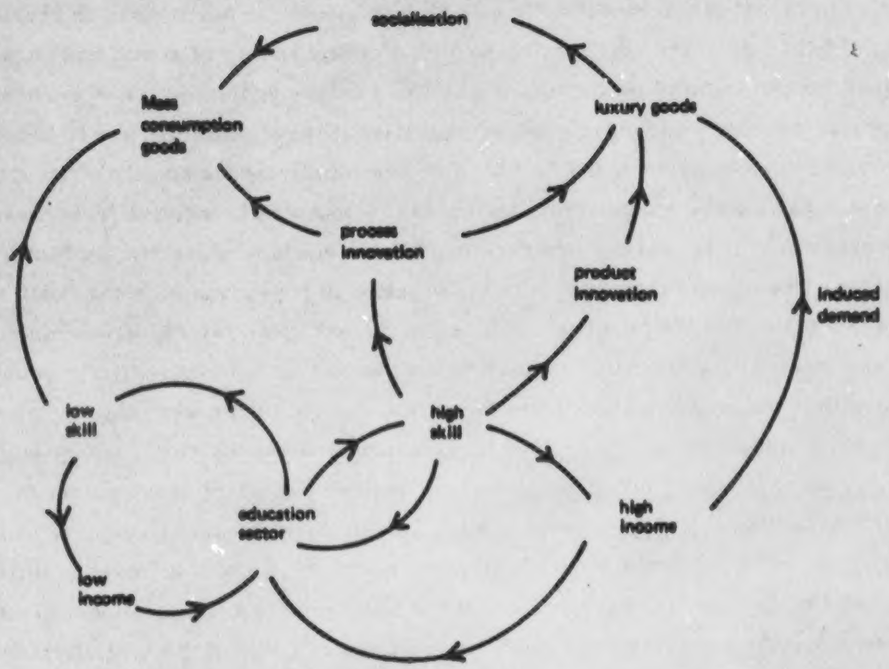
socialisation
Mass consumption goods
luxury goods
process innovation
product innovation
induced demand
low skill
high skill
education sector
high income
low income

Figure 10. A schematic model for educational and economic distribution

Note: International markets, demographic factors and investment in education, research and development and production are not shown

specified variables implicit in those economic assumptions. It is particularly at this point, in making clear the implications of non-quantitative assumptions about development styles and education, that specialists have an important contribution to make to the modellers themselves.

FORECASTING MODELS APPLIED TO EDUCATION

by A. Saveliev

The layman might regard the working out of models in a field such as education as merely following the fashion of the day. Now, the object (and subject) of teaching regarded as the technological base of education, is man. If one means by model, when it be an object or a process, a certain representation of this object (or process), expressed by means of a formal language specifically designed for the study of their characteristics, it is essential to describe human behaviour within the framework of teaching. Obviously the question posed in this way is bound to seem amusing, since such a description is clearly impossible for the time being. It nevertheless remains true that in the field of education, it appears perfectly justified to work out models in order to solve localized problems relating to teaching and the preparation of specialists who have completed higher studies. In order that our overall understanding of the phenomenon may not be deformed by a partial view, a systems' analysis must be worked out, enabling the whole to be divided up into parts without affecting the existing links. The aims of this study is to outline the setting up of a systems' analysis based on the working out of models applied to the concrete problems posed by the training of specialists in the V.U.Z.[1]

Among the main problems posed by higher education may be mentioned the following: (i) the training of specialists capable of meeting the demands of scientific and technical progress; (ii) education contents; (iii) improving educational efficiency.

Let us examine these points in detail.

1. The training of specialists capable of meeting the demands of scientific and technical progress

For many fields of human activity, the training of specialists capable of meeting the demands of scientific and technological revolution, may be summed up very schematically in Figure 1.

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[1] V.U.Z.: Higher-education institution.

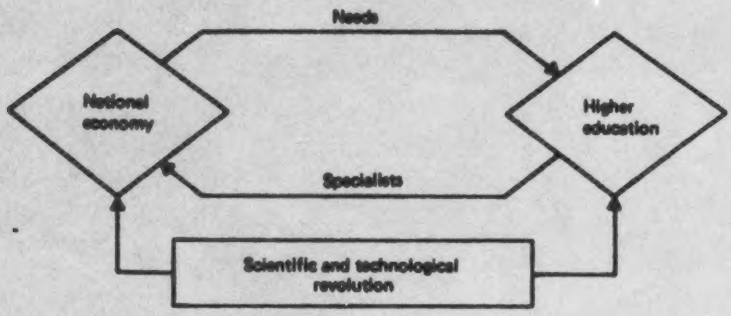


Figure 1

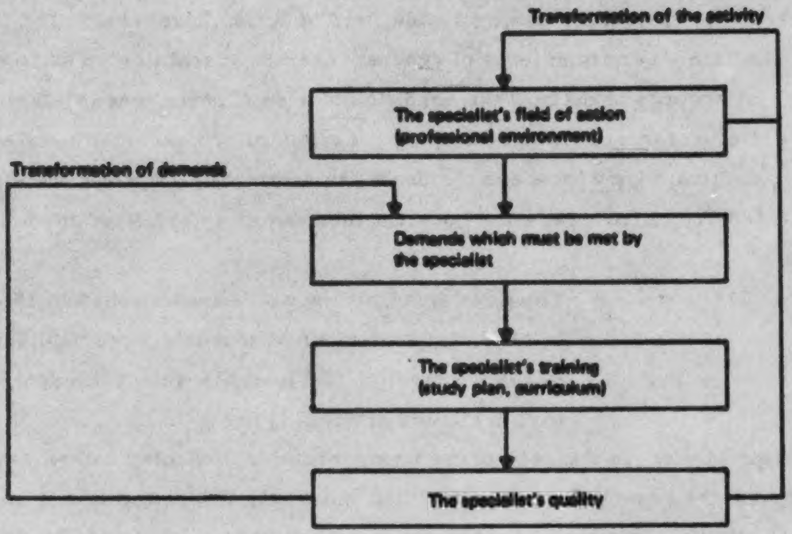
It is the scientific and technological revolution which brings about the radical changes not merely in production techniques and technology, but also in the nature and contents of human labour. This is revealed by the demands with which specialists are nowadays confronted. Higher education must "reflect" them so that they become one of the components of the specialist's quality. The scientific and technological revolution "shrinks" time, as is witnessed by the frequent changes of machinery or technological processes (an electronic calculator, for example, is replaced every five or seven years). Moreover, with respect to innovations and discoveries, the rates of assimilation are ever more rapid:

- 1,000 years for paper to come into common use
- 80 years for steam-driven machinery
- 50 years for the telephone
- 20 years for the aeroplane
- 3 years for transistor technology.

More discoveries were made over the last ten years than during the previous 2,000 years.

These factors are at the roots of the basic problem: how to combine the inertia inherent to the very process of training specialists, with the speed at which changes will take place in their activity or professional environment. (The professional environment being in this case the specialist's field of action).

It is clear, then, that in order to guide the training of specialists, one must be in the position where there is no prior model permitting optimum management of the system, the working out of such a model being precisely the task of the system itself. As the process for training specialists has not yet been completely worked out in a formal manner, we are accordingly obliged to gradually work out a model applicable to it. This is why simplified models are often used, such as the model shown in Figure 2 below.


Transformation of the activity
The specialist's field of action (professional environment)
Transformation of demands
Demands which must be met by the specialist
The specialist's training (study plan, curriculum)
The specialist's quality

The use of simplified models is, however, by no means useless to the extent that one acquires fairly accurate results by making use of the interrelational method. Moreover, such models enable quality judgments to be made. If one considers, for example, that inertia is one of the components of a student's training, one may deduce from this that integrating the student as quickly as possible into a scientific and practical activity in a professional environment is the best way of reducing the divergences between the demands he will have to meet as a specialist and his professional qualities. This is the basis for the training of specialists in many V. U. Z. s throughout the country. This also explains the fact that research carried out by the students themselves now forms an integral part of the training provided in the technical V. U. Z. s.

2. Education contents

Figure 2 shows that the analysis of the contents of a specialist's professional activity permits the definition of training requirements, that is, the specification, within study curricula, of the main points, and their linking together. This enables a sequential model to be worked out, to be placed over a timetable, allowing for the following restrictions:

- Quantity of subjects studied (not more than 5 or 6 at once);
- Maximum work load per week and per subject;
- And, the limited number of teaching hours.

This work results in an organized timetable on which will be based the study plan for the speciality. To work out such a model, one must know the subjects to be studied, teaching methods (lectures, practical work, laboratory work), and the quantity of material to be assimilated during class hours.

At the present time the teaching provided in the V. U. Zs must endeavour above all to train specialists with broad qualifications, who can bring to the benefit of their profession all modern facilities available to them. This depends on a series of data, in particular the extension of the fields regarded as "accessory" to science and technology, and the dynamics of the work distribution system.

To train specialists having a wide field of action, one must:

- Attain a very high level of general theoretical training so as to ensure it against any risk of ageing and make it the condition of a continuous renewal of knowledge.
- Define for each field of activity a system of professional knowledge.
- Cultivate know-how and the desire to continually improve one's personal knowledge.

A feature of our era is the constant increase in information in various fields of human activities.

- The first scientific journal was published in 1665;
- In 1885, 1,000 periodical journals were published;
- In 1965, over 100,000 journals were published, in which were printed over 5 million articles (per annum).

This is why, in the case of the new generation, teaching can no longer merely consist in feeding it with the essential information, but must help it learn to find it or, speaking figuratively, provide it with the "Ariadne's thread" which will guide it through this labyrinth in its quest for knowledge.

This role of guiding clue "lies with basic or general theoretical training" to the extent that it must provide an overall understanding of the problems faced by the specialist, and provide the theoretical basis for a thorough assimilation of the subjects related to his speciality. In addition (and this is perhaps the main point) basic training must achieve the most important pedagogic task, consisting in developing and educating the specialist. To look at basic training from this viewpoint requires a change in conception of the basic disciplines. Accordingly, in our country, we have determined, in a number of higher-education institutions, what subjects such as mathematics or physics should be, and transformed the traditional appearance of their contents and presentation.

The working out of models also facilitates the solution of major problems such as the setting up of a network of scientific knowledge on the basis of which the system of school disciplines may be defined. Over the last few years the classification of knowledge has been made on the basis of sequential planning (e.g., the graphological method). However, it is no use employing the mathematical apparatus of sequential planning to solve such problems unless all the possible principles of systematized knowledge in any professional field whatsoever have been updated and described.

To determine the importance of a discipline in a specialist's training, the method of expert evaluation is employed. For this purpose, specialists employed in various sectors of the national economy are questioned regularly, as are postgraduate students in the V.U.Z.s. The surveys are then analyzed, and curves plotted of the distribution of root-mean-square deviations. If there is a very marked peak on the distribution curve, this confirms that education contents in the speciality in question should be frequently reassessed. If there are two peaks on the curve, this means that preparation should cover two possible specialities. For example, the survey carried out concerning "automation and telemechanics" enabled two possible specializations to be specified: (i) automation and telemechanics components and assembly; (ii) automation and telemechanics systems.

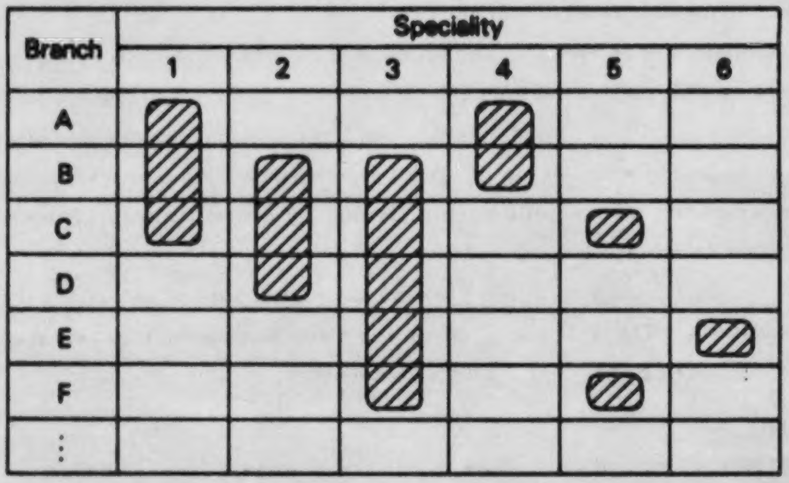
The foregoing illustrates in particular the interaction between education content and the list (nomenclature) of specialities. In the higher-education institutions of socialist countries, the specialities are distinguished from one another, new ones appear and old ones are abandoned. For example, within the Soviet Union's national economy close on 100 different branches of activity can be distinguished, and approximately 420 specialities at the higher-education level grouped together in 22 extended groups incorporating additional specialities. How have these specialities been created? Their classification within the framework of education can be made according to various criteria.

For a sector of activity to become a separate speciality one must first of all define its object. The word object may be taken either in its primary, concrete sense, or as the performing of an activity. For example, for a psychologist the object is the personality of the human being, for the engineer working on the engineering of flying apparatus the object is the aeroplane, while for the technologist the object is the technological process. Such a classification will be called classification as a function of the object.

This approach as a function of the object may be made on the basis of various principles. For classification relating to scientific activities, the object is the corresponding sector of science (e.g., the classification of the sciences according to Kedrov or the classification of specialities according to the breakdown by grades in the USSR or USA). If the determining factor in this classification is related to branches of the national economy, we can then make such a classification in two ways: (i) by branch of intersectorial activity; or (ii) by branch of sectorial activity.

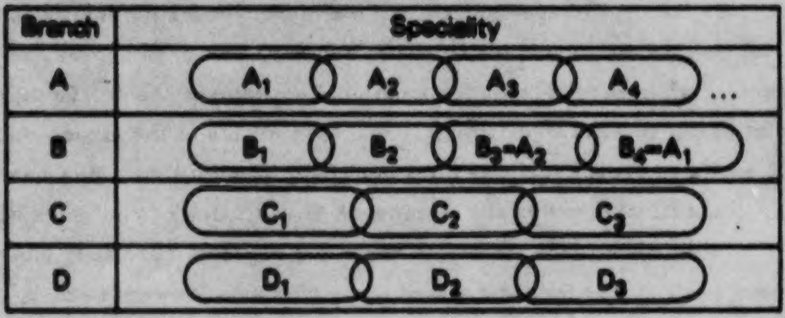
The specific nature of these classification techniques is shown in Figures 3 and 4.

Figure 3. By branch of intersectorial activity



Branch	Speciality					
	1	2	3	4	5	6
A	▨			▨		
B	▨	▨	▨	▨		
C	▨	▨	▨		▨	
D		▨	▨			
E			▨			▨
F			▨		▨	
⋮						

Figure 4. By branch of sectorial activity



Many specialities belong to various branches of activity, as in the case of engineering. The activity (of an engineer, an economist, etc.) may in turn be classified according to the following criteria: (i) tools and work facilities; (ii) object of work; (iii) technology; (iv) transport; (v) energy; (vi) organization and management of the activity.

All these methods of classification of specialities may be used within the framework of a supervised, specialized training programme, with preestablished characteristics. For example, the classification adopted by Unesco (ISKED) concerns education curricula. The objects of the classification are: (1) the pattern of education regarded as a whole combining data concerning either a concrete subject or the acquisition of know-how; (2) the curriculum worked out on the basis of one or more study courses; (3) the branch of activity: combination of curricula concerning one single subject.

The classification of educational specialities adopted by the USSR is based on a global approach. The nomenclature of the specialities in the V.U.Z.s must take into account present trends in scientific and technical development, and take the form of specialities grouped as a system rather than be a rambling list. The working out of a nomenclature on a scientific basis is a difficult job, raising numerous problems of methodology and organization. Excessive distinctions can lead to duplication. This can be shown by using "distanciation models". The distanciation model takes the form of a triangular matrix whose cells permit listing, by classification, of the number of disciplines leading to differences of curriculum.

For example, Table 1 shows the distanciation matrix for the "chemical technology" grouped specialities. The analysis of schooling plans has shown that two groups of specialities can be distinguished, having only four distinct components:

Group 1

T.C.6 - Chemical technology of ductile materials

T.C.30 - Chemical technology of ceramics and refractories

T.C.31 - Chemical technology of glass

Group 2

T.C.10 - Chemical technology of plastics

T.C.28 - Chemical technology of plastics' processing

T.C.33 - Chemical technology of fibres

T.C.35 - Chemical technology of synthetic rubber

The fact that students who have completed their studies in one of these specialities frequently hold the same jobs merely confirms the resemblance between these fields.

3. Educational efficiency

The increasing flood of information (mentioned above) is not the only consequence of the scientific and technological revolution, another consequence being the differentiation of knowledge in all sectors of human activity. For example, an engineer's work is sooner or later subjected to scissions, that is, an increase in the number of specialities. This leads to a paradoxical situation. On the one hand, to promote practical activity a specialist should be able, on completion of his studies, to "be integrated" into an actual job at the post he is assigned to; on the other hand, a specialist's training aims at providing him with a large field of action, that is, it combines the differentiation of knowledge and integration. Analysis of the schooling plans for certain technical specialities from the viewpoint of the cycle of disciplines determining the training profile of specialists in the V.U.Z.s (Table 2, based on the example of "metallurgy and construction of electrical equipment" groups of specialities) shown that on average the following cycles are obtained:

- general scientific cycle 20.2%
- general technical cycle 17.5%
- general professional cycle 7.9%
- specialized cycle 18.7%
- others 35.7%.

To sum up, it can be seen that for a 5-year cycle, depending on the speciality, between 1.5 and 2.5 years of basic training must be allowed for, and 1.5 to 2 years of specialized training (assuming that basic training includes the general scientific and technical study cycles, and specialized training the general and specialized professional study cycles). We have worked out this comparative analysis in order to determine whether this law is specific to the higher-education institutes in our country or if it is general. Table 3 sets out the results of this comparison for the "industrial and civil engineering" speciality, according to a model USSR plan adjusted to the level of the end of the secondary cycle in the USA.

The table shows that the rise in the level of education revealed by the quality of the specialists' training, depends on an improvement in basic and special preparation. We can accordingly say that a high level of integration in the preparation of specialists (development of basic training) leads to more efficient training from the economic viewpoint.

The above proposals should be considered when examining the prospects for the development. of specialized higher and secondary education in our country. We are at present studying forecasts for the year 2000. Now, one cannot make forecasts concerning any type of system (whether social, economic or technical) except on the basis of a study of present trends, which should be firm and stable. The stability of the training system for specialists may be confirmed by means of one of its development indices: the number of graduate specialists in relation to the total nomber of students. This is especially clear if we take the example of specialized higher education (Table 4) and specialized secondary education (Table 5) from 1940 to 1976.

The graduation/matriculation ratio reflects variations in these two data elements. The index is more sensitive to population changes.

The integral index on the basis of which are calculated the requirements of specialized higher and secondary education for graduate specialists, is the saturation index S, which is the number of specialists per thousand inhabitants employed in the national economy (Table 6).

Table 1. The distanciation matrix for the "chemical technology" grouped specialities

	TC-2	TC-3	TC-5	TC-6	TC-7	TC-8	TC-10	TC-11	TC-12	TC-28	TC-30	TC-31	TC-32	TC-33	TC-35	TC-36
TC-2	Z	7	7	9	7	5	6	7	7	6	9	9	6	6	6	8
TC-3		Z	8	7	6	6	7	6	8	7	8	8	5	7	7	5
TC-5			Z	10	8	6	7	8	8	7	10	10	7	7	7	9
TC-6				Z	10	7	8	10	10	9	4	4	7	9	9	11
TC-7					Z	6	7	6	8	7	10	10	7	7	7	7
TC-8						Z	5	6	6	5	8	8	5	5	5	7
TC-10							Z	7	6	4	9	9	6	4	4	7
TC-11								Z	8	7	9	9	6	7	7	7
TC-12									Z	5	10	10	7	7	5	9
TC-28										Z	9	9	6	4	4	7
TC-30											Z	4	7	9	9	11
TC-31												Z	7	8	9	11
TC-32													Z	6	6	8
TC-33														Z	4	8
TC-35															Z	8
TC-36																7

Table 2. Comparative table of discipline cycles characterizing the speciality training profile

Designation of discipline cycles	"Metallurgy" speciality group					"Construction of electrical equipment speciality group"								Range of processes
	1	2	3	4	5	1	2	3	4	5	6	7	8	
1. Social and political	9.81	9.68	9.72	8.78	9.70	9.70	9.61	9.61	9.65	9.61	9.61	9.61	9.31	9 – 10
2. General scientific	22.95	22.64	25.60	27.57	18.41	18.36	18.20	18.20	18.27	18.20	18.20	18.20	17.62	18 – 27
3. General technical	16.82	18.03	18.04	11.71	17.39	18.94	19.36	19.65	15.38	16.75	18.22	18.54	19.49	11 – 19
4. General professional	9.04	7.23	9.44	14.82	8.00	5.44	5.39	7.16	6.42	7.87	9.15	7.68	8.37	5 – 14
5. Specialized	14.55	18.62	11.43	14.38	19.79	20.80	20.91	19.15	23.28	22.51	19.90	18.39	18.52	11 – 23
6. Economic	4.23	4.14	4.35	4.66	4.16	4.15	4.11	4.11	4.13	4.11	4.11	4.11	3.98	4
7. Disciplines created by the scientific council of the V. U. Z.	4.39	1.69	2.61	1.88	4.42	4.61	4.58	4.28	4.96	3.11	2.97	5.63	5.44	3 – 5
8. Other	18.21	17.97	18,81	16.77	18.05	18.00	17.84	17.84	17.91	17.84	17.84	17.84	17,27	17 – 19
In all	100	100	100	100	100	100	100	100	100	100	100	100	100	

Comment

Specialities

METALLURGY:
1. - Iron-and-steel industry
2. - Non-ferrous metallurgy
3. - Foundry
4. - Physical and chemical research on metallurgical processes
5. - Metal processing under pressure

CONSTRUCTION OF ELECTRICAL EQUIPMENT:
1. – Electrical machinery
2. - Electric drive
3. - Electrical equipment
4. - Electronic equipment
5. - Industrial electronics
6. - Aeronautics equipment
7. - Electrical equipment for ships
8. - Automation of the metallurgical industry

Table 3. Comparative table in the "industrial and civil engineering" speciality for the higher education institutions of the USSR and U.S.A.

	Model schooling plan in USSR			Model schooling plan in U.S.A.	
		Hours			
Groups of disciplines	Total	lectures, laboratory work	% Total number of class hours	Total hours (points earned)	% Total number of class hours
Social sciences and humanities	640	640[1]	15.5	330(22)	16.2
General, scientific and technological	1 326	872	32.0	780(52)	38.2
Special	2 173	1 833	52.5	930(62)	45.6
Total	4 139	3 345	100.0	2 040	100.0

1. Including practical studies related to foreign languages.

Table 4. Characteristics of the development of higher education in the USSR[1]

Year	Entrants (in 1000s)	Graduates (in 1000s)	Number of students (in 1000s)	Number of students per 1000 inhabitants
1940	263.4	126.1	812	41
1965	853.7	403.9	3 861	166
1970	911.5	630.8	4 581	188
1975	998.8	713.4	4 854	190
1976	1 012.5	734.6	4 950	192

1. Comment: see "The National Economy of the USSR over the last sixty years". Yearbook of the Central Departement of Statistics, Moscow 1977.

Table 5. Characteristics of the development of specialized secondary education in the USSR[1]

Year	Entrants (in 1000s)	Graduates (in 1000s)	Number of students (in 1000s)	Number of students per 1000 inhabitants
1940	382.9	236.8	975	50
1965	1 099.7	621.5	3 659	158
1970	1 338.4	1 033.3	4 388	180
1975	1 403.9	1 157.0	4 525	177
1976	1 416.1	1 109.1	4 623	179

1. Comment: see "The national economy of the USSR over the last 60 years", Yearbook of the Central Department of Statistics, Moscow 1977.

Table 6. Calculation of saturation

Year	Numbers of workers and employees (in millions)	Number of persons employed in the kolkhozes (in millions)	Number of specialists with secondary and higher level specialization (in millions)	Saturation index (Spe./1000 pers.)
1940	33.9	29.0	2.4	38.2
1950	40.4	-	3.3	-
1960	62	-	8.8	-
1965	76.9	18.9	12.1	126.3
1970	90.2	17.0	16.8	156.7
1975	102.2	15.4	22.8	194.
1976	104.2	15.0	24.0	201.3

The principle of planned development, which is the principle of socialist production, shows that this development must be harmoniously distributed among all branches of activity of the national economy. The correlation between the rate of growth of executive requirements and the rate of development of executive training proves the satisfactory functioning of the law in this field. Such a ratio should be optimal from an economic viewpoint. Two factors promote the attainment of this optimum ratio: the efficient use of specialized executives and of the resources provided by their training system.

WHAT OF EDUCATION FOR THE FUTURE?

by Hugues de Jouvenel

The problem of education is pre-eminently a subject which cannot be dealt with without relating it to a certain conception of man and to a certain vision of society as it is today and as it might be in thirty or forty years' time. Our system of education is essentially the product of our cultural heritage and every-day experience but, at the same time, its objective is to train the individuals who will make up tomorrow's society.

Thus, we are constantly faced with the dilemma of reconciling a respect for traditions with the need to adapt to new situations. The problem itself is not new, but it assumes particular importance when the pace of change quickens to the point where, within the space of a generation, it can cause a vast social upheaval. Over the past few decades, we have in fact been living in a world where the material and non-material aspects of existence have been changing rapidly: the population explosion, the rapid advance of science and technology and the pace of economic growth have profoundly modified our way of life. They have also called into question man himself, forcing him to make an often agonising reappraisal of his philosophic and moral conceptions.

During this period of great change, obsolescence has been made a principle of life, so as to ensure a rapid turnover of goods - this is true today for the home, formerly a symbol and a guarantee of family continuity, as well as for more mundane objects. But this feeling of impermanence is associated not only with objects, it has been extended to every area of life, to such an extent that our society has rightly been called the "throw-away" society. This term not only applies to objects, but also to people, to what were once the sacrosanct rules of morality and to the wisdom ascribed to the teaching of our elders.

For a long time organised society was considered as something which should be stable: everything contributed to the preservation of the established order and the retention of practices which had stood the test of time. Today, by contrast, conservatism and time-honoured traditions are unfashionable and everyone behaves as if history had no valid lessons to give us, as if the fruits of experience and knowledge were all perishable.

This idea of impermanence has, in my opinion, been given far too wide a currency to the point where it encourages a profound apathy towards things of lasting value. Granted that people are showing an increasing interest in centuries-old oak trees and buildings bequeathed to us by our ancestors, but our own society produces nothing similar and indeed treats with great scorn the slow processes and delicate balances of nature. And so too with the things of the spirit: although it may venerate a few of the ancient philosophers, our society is generally apt to challenge old beliefs and give little credit to knowledge which is not of recent date.

No doubt, there has been a failure to distinguish between know-how, which in fact evolves rapidly and requires continual updating, and knowledge, with the result that the old idea of wisdom has fallen into disrepute whereas the illusion of perpetual change in the entire realm of knowledge has been gaining ground. The belief that nothing is permanent has no doubt contributed greatly to discrediting history, culture and tradition which have been rapidly relegated to the attic.

The school is more than ever faced with the contradiction between the past on which it is based and the future for which it is preparing. Its social task is made all the more delicate by the fact that if it were to base itself solely on the past, it would then simply perpetuate practices which would prove inappropriate. On the other hand, however, it cannot plan its teaching in relation to a future which is so complex and uncertain. In fact, the school will have to draw upon the past and the manifold visions of the future, acting as a teacher vis-à-vis its pupils and as a mediator between successive generations. It should accordingly constitute a powerful influence in maintaining social balance and, at the same time, in promoting social progress.

I. Education and society

A we emphasized earlier, the problem of education has to be analysed within the context of certain conception of man and a certain vision of society. The whole difficulty with education stems from the fact that it is designed on the basis of the past, whereas it is intended to serve the future. It would scarcely be an exaggeration to say that the school is a mould bearing the imprint of the past, in which one intends to fashion the future.

Therefore, the first task must be to question the validity of an education based on a conception of social and individual development which, to my mind, is mistaken.

In fact, in our industrial era, the idea of development has wrongly been taken to mean economic growth, i.e. an increased exchange of goods and services. The Gross National Product (G.N.P.) has become the embodiment of the medieval notion of the Common Good and the universal measure of success is now the more recent notion of achieving an increase in this same G.N.P., and this has become an article of faith for every nation.

It is not our intention here to repeat the criticism of this phisolophy of growth, or point out the physical limits (depletion of resources, pollution and other detrimental effects) which could constitute obstacles to its indefinite progress, or recall how much poverty underlay our wealth, based as it was on a monetary fallacy. But it is vital to our argument to assess accurately the social consequences of this marathon race organised in the name of G.N.P. Whereas in the XVIIIth Century, the majority of the population was made up of groups of peasant farmers, primarily self-supporting, the coming of the industrial era brought about a radical change in methods of production and ways of life. As Adam Smith pointed out, the economic and social structure was completely revolutionised by the division of labour which, he said, in time would lead to each man's needs being satisfied by the work of another, whom he would pay out of the wages he himself earned for his own work.

Man therefore performed two roles: that of producer and that of purchaser; As producer, his task has become more and more specialised, sub-divided and repetitive. This is of course true of the worker on a production line, but it is also true of a large number of workers employed in posts of a higher grade. As the scope of the individual's activities has lessened, he has become increasingly dependent on services provided by others, with the result that the range of "things done", made by oneself, has narrowed whilst the range of "things owned" has widened.

But the things owned are inevitably mass-produced; they no longer have any individuality, they have become common place. The highly specialised man, victim of a perpetual struggle between consumption and production, is someone who loses every day a little more of his liberty and his identity. In contrast to the man who turns his hand to a variety of tasks and who therefore finds himself constantly obliged to make use of his own abilities, his counterpart in the consumer society is a person most of whose physical, emotional and intellectual abilities are dormant.

Embarked upon this process of an increasing division of tasks, we have been caught up in a vicious circle of production and consumption which has rapidly gone beyond the stage of satisfying our basic needs (food, health) to include the satisfaction of the higher emotional and intellectual needs, with the result that the problems of well-being and the quality of life have in turn become items of trade and thus mass-produced and sub-contracted. The most striking example of this is, without doubt, the immediate "medicalisation" of any physical or emotional problem; it also means the transformation of human problems into technical problems and, ipso facto, the transfer of the responsibility of BEING to an institution distributing GOODS.

From the standpoint of the individual, the consequence of such specialisation is nowadays plainly visible in our developed countries. It was realised that, once the individual became aware of the drawbacks and limitations of this growth process, he was less and less inclined to assist in the pursuit of economic progress, the benefits of which had become questionable. This has had two fortunate consequences:

- On the one hand, the individual, instead of sacrificing body and soul to a system which, in return, only offers him an accumulation of goods and services whose marginal utility is constantly receding, is looking for a more personal life-style; for evidence of this one needs only to look at how the attitude to work is changing: no longer does the worker merely expect to get a wage but also some form of personal satisfaction and a reduction in working hours is welcomed so that he has more time to devote to another activity. Similarly, consumerism and consumer groups could also be quoted as signs, however tentative, of the individual's desire to regain some control over his destiny.
- On the other hand, whereas the pace of technical and economic progress is slowing down, employers are themselves slowly becoming aware of the importance of the human element. Nowadays, no organisation could operate without the goodwill of its staff and they will only agree to co-operate provided their work is meaningful and not merely a task which could be performed by a robot.

It is becoming gradually apparent therefore that it is madness, both for the individual as well as for the organisation, to utilise only a minute fraction of man's productive capacities. And it has now become of vital concern to find ways of extracting the utmost value from human resources rather than waste them as we have done with those of nature.

This argument holds good not only for the satisfaction of the individual but also for the development of the nation as a whole. For many years, the problem of development was regarded as being merely one of setting in motion a purely technico-economic process. One talked in terms of transfers of technology, assistance for industrialisation and of course there did not seem to be any reason why the system should not be the same for every country. Thus, the tendency was to take the country with the highest G.N.P. as a model and simply transpose the norms, the type of equipment and the processes from one country to the other.

It was not until the seventies that it was realised that the process of development would not succeed unless the same attention were paid to socio-cultural factors as to technico-economic factors and that, consequently, development models should vary in relation to the advantages and disadvantages of each country, each region and each culture.

In short, there is a growing recognition of the fact that human beings are different, that each follows his own path through space and time. One sees also that these paths cross, combine and conflict, that each individual has a separate identity whilst, at the same time, being at one with his fellows. This recognition of each person's individuality is also the product of the different societies, ethnic groups and nations which live together on the planet, and, whilst it is important that each should accept a certain number of rules, relating in particular to respect for one another and for the planet itself, it would however be madness to attempt to impose the same pattern of education on everyone, irrespective of his cultural heritage, his region and his own aptitudes.

II. A new attitude

I stated at the beginning that it is impossible to discuss education without relating it, from the outset, to a certain conception of man and a certain vision of society and the reason why I have been placing so much emphasis on the problems of growth and development is because it seems to me that the educational system is a direct outcome of this.

As proof of this I would quote the fact that our society, with its highly organised structure designed to serve the requirements of industrial production, has resulted in an increasingly pronounced segregation of man, time and space: as for instance with old people, the handicapped, women and children who, on the pretext of the need for special social protection for each category are all put into separate compartments.

As Philippe Aries has pointed out[1], children in the Middle Ages mixed with adults from the age of seven, so that they learnt about life through this daily contact with reality. Nowadays however, each category of the population is isolated and, depending on the age group involved, subjected to the care of some specialised institution or other. No doubt, there is no lack of arguments to justify this development which, to a large extent, is the result of an excessive division of tasks and the transfer to institutions of what were formerly individual responsibilities. As proof of this, one needs only to instance the fact the adult male, who has become a complete slave in his rôle as a productive unit, has gradually relinquished his rôle as a teacher, delegating this function to specialised institutions (and this again is evidence of the evil which we have attempted to condemn, i.e. the hypertrophy of one function resulting in the atrophy of the remainder).

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[1] Philippe Aries: L'enfant et la vie familiale sous l'Ancien Régime, Editions du Seuil, Paris.

It is astounding to learn that nowadays scarcely 20 per cent of the children in France are lucky enough to have parents who have "time to spend with them"[1] and that, in the majority of cases, these parents, obsessed by the idea of efficiency and results, devote most of the time they spend with their children to helping them with their homework.

The same comment could be applied to our environmental space: modern housing conditions have not brought about an improvement in family life. Homes have become functional structures rather than places to live in. At most, the architect might design a small corner for the children, rather like the urban planners who will provide a special place in some isolated corner of their parks where children are allowed to play.

This segregation of functions and space has naturally led to the development of specialised institutions like the school which, right from a very early age, keeps the child shut in - in defiance, moreover, of all the major physiological and psychological principles. A child has need of properly regulated periods of contrasting activity, e.g. waking - sleeping, hunger - satiety, immobility - agitation, work - play, concentration - reverie, bright light - obscurity, freedom of the outdoors - security of the home. The school however imposes a long period of immobility and an almost unvaried type of activity on the child. Professor Debré, who is by no means in favour of allowing children to do exactly as they wish, is the first to insist on the need to alternate activities so as to give the individual the opportunity to make use of his physical, intellectual and emotional capacities.

Rather than this, however, the child is subjected to school routines with their excessive number of hours in the classroom, insufficient recreation periods and a whole series of restrictions. The result is emotional problems such as unruly or aggressive behaviour, which in fact are signs of a healthy reaction. It is society which in fact is sick and which is the cause of this emotional disturbance amongst children, which one then tries to cure by doses of medecine and psychotherapy.

The school in fact is a training centre where one learns to suppress one's instincts and replace these by a form of behaviour compatible with our social system, so superbly organised along such superficial lines.

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[1] According to Dr. René Kiatkine, psychiatrist-psychoanalyst, quoted by Catherine Arditti "Enfants d'aujourd'hui" (Today's children) in Le Monde, dated 6 November 1976.

Evidently, education has been designed like a rolling mill to produce men cut to certain stereotyped shapes to fit certain social positions within the system of production. Some authors[1] go so far as to say that the first task of the school is to clear the ground, get rid of anything that is original, innate or spontaneous and then inject another culture and a ready-made set of ideals. It is in fact apparent that education seems to be designed primarily to make the child a docile disciple of a code of conduct consistent which the social order and an efficient cog in the economic machine. As a result, more emphasis will be laid on his imitative ability rather than on his imaginative capacity and greater play will be made of his need for security rather than his taste for adventure.

Patently, the prime function of the school is to fit the individual for society and thus erase the differences. What was at the outset a necessity, i.e. mass education, has gradually become an ideology, of which the myth of equality and the myth of the diploma are only two aspects among many. In the main, education has primarily been a question of training individuals so that they fit as well as possible into the existing structures and are least likely to incur the penalty of social exclusion.

Consequently, the function of education has been essentially to adapt individuals to a social pattern, which itself was the result of a mistaken conception of social and individual development. We have already laid sufficient stress on the confusion which has been perpetrated between the idea of development and the idea of growth - a confusion for which we are paying the price today in the form of the reluctance of certain individuals to contribute to the pursuit of "progress".

The same criticism could be levelled against the objective of the "quality of life" which has now become so fashionable in our societies and which, once again, tends do make the individual the the beneficiary of a collection of goods and services, rather than providing him with the opportunity to exploit his own capacities. As every-one knows, "man has a profound biological need to be recognised for what he does and if his individual merits are not recognised, he may experience a profound feeling of frustration and insecurity".[2]

A man is made by what he does - his personality is shaped by the continual exercise of a variety of activities which bring into play his intellectual, emotional and physical capabilities. It is by making use of his own individual resources that man finds fulfilment. The policy of the quality of life which reduces the individual to a single dimension, restricts him to a single activity, whilst suggesting that for the rest he relies on the benefits of the Welfare State and mass production, is a policy contrary to nature which will inevitably lead to a growing dissatisfaction for the individual and to the paralysis of our institutions.

What is at stake today therefore is our capacity to devise and develop a new social system which recognises the need for human fulfilment. That is to say, which provides individuals with every opportunity to make use of their intellectual, emotional and physical capacities - and also, which enables man to be a human being with all that this implies in terms of diversity and common interests.

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[1] Michel Arrouays and Donald Moerdijk: Notre école est une colonisation, in Le Monde, 12 October 1978.

[2] Dr. Hans Selye, in Canadian Weekly Bulletin, November 1972.

This is both a need and a necessity, because what is involved is not only the destruction of the individual, but also the very survival of a system whose mechanism is beginning to seize up and whose main driving force is failing. "Every modern organisation relies increasingly on the goodwill of its members, on their capacity to adapt and to innovate, and on their ability to co-operate with one another".[1] The more complex our organisations are, the less they are able to function simply by applying a set of rules or by setting machines in motion, and the more they must be able to rely on active co-operation from their staff and the willingness of each to contribute something of himself to the common effort.

However, the problem is not one of finding some subtle methods whereby we could induce individuals to participate or enlist their support for a crusade in which they do not believe. What is needed is to invent new human objectives and new methods which evoke a response from man. In the words of A. de Tocqueville, "a central authority, however enlightened, however great its wisdom, cannot itself encompass every aspect of the life of a vast nation. The collective strength of its citizens will always be more powerful in producing social well-being than the authority of a government".[2] But this collective strenght will not manifest itself unless one has been able to define development objectives which are more in harmony with individual aspirations.

In this regard, it is now vital that we should adopt a new attitude towards the problems of development, taking into account the fact that each individual, each country, has specific strengths and weaknesses which it would be dangerous to ignore on the pretext that one is applying a standard model of progress.

III. What goals for education?

The aim therefore, where education is concerned, is not to produce individuals who will be efficient cogs in a social machine, but rather to develop in each of them the rich range of human resources which can contribute to their individual fulfilment and to the progress of society.

Every individual is biologically different: each has a range of potentialities which ought to be cultivated rather than sacrificed for the sake of an overall uniformity. The primary goal of education must be to "develop in an individual all the perfection of which he is capable" (Kant) and thereby cultivate all his latent abilities. The development of the human capacity inherent in each individual will be more than ever necessary if man is to be able to face the challenges of the future and to fashion this future in accordance with freely discussed social objectives.

The challenges of the future mean that we have to begin now learning an entirely new way of thinking. In fact our society, which is characterised by an excessive division of tasks, has led to a multiplication of "specialities". Each discipline has produced its own theories and its own jargon. Take for example social phenomena which, for a long time, have been viewed only in monetary terms, with the result that all the factors which were not immediately quantifiable in such terms, were omitted. Generally we are suffering from, on the one hand the lack of any overall view and, on the other, from an artificial division of reality into isolated segments of knowledge.

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1. Michel Crozier. La Société bloquée, Paris, Seuil, 1970.
2. A. de Tocqueville. De la démocratie en Amérique, Paris, Gallimard 1968.

However, it is not obvious that by combining these separate segments of knowledge we shall be able to obtain a thorough understanding of society's problems and the variables which govern these nor, as a result, to end up with appropriate and effective policies.

In fact, whatever problems are analysed, they all have in common a multiplicity of variables, not always clearly identified, which are all linked by various forms of inter-relationship, again not always clearly defined.

The primary aim of education must be to develop an individual's ability to perceive realities in their entirety. One must cease to regard problems from the angle of a single variable, i.e. a linear form of reasoning. Instead, one must develop the ability to reason systematically, in such a way that problems are analysed taking into account the different variables involved and the different combinations to which these can give rise.

Reasoning on the basis of reality also means learning about time in all its various dimensions. Because, of all the variables entering into our combinations, we need to pay particular attention to the dynamic elements and be able to make allowance for the fact that each factor evolves at its own pace and that such differences of pace may be the cause of a breakdown. The most striking example of this is the differences between ecological cycles - generally slow - and the more rapid industrial cycles: this is the well-known dilemma of exponential growth and linear growth.

All this may seem somewhat remote from the problem of education, but a certain number of ideas follow from this and we shall be looking at these in greater detail.

The first idea which we should like to put forward is that education should not strive to produce an accumulation of disjointed knowledge but rather to develop the individual's ability to grasp reality, by which we mean to deal with problems in an empirical and systematic way.

We have however been steeped in great theories and, alas, are more inclined to fit reality into analytical formats, often arbitrary, rather than examining problems in their entirety.

This can no doubt be explained by our inability to grasp complex phenomena or how ill at ease we feel when we are confronted with situations which cannot be related to anything we know or have experienced.

The anxiety aroused by the unknown is so potent that we are prepared to accept any plausible explanation. We have proof of this every day in the attitude which the layman adopts towards those who enjoy the reputation of being experts; likewise the excessive distrust of futurologists who, like the oracles of antiquity, claim to have knowledge of the future; likewise the disturbing success of new religions.

The feeling of instability, of forces beyond his comprehension, of impotence in the face of a world gone mad, is no doubt largely responsible for making man into an anxious and passive individual, craving for protection.

One of the essential tasks of education must be to teach individuals to think logically about a problem, without immediately referring it to a higher authority and without reducing it to such an extent that it loses all its substance. One must cease reasoning in terms of disciplines and theories and learn to cope with complexity and uncertainty.

The second idea is that education should provide a training for the mind so that it can grasp different combinations of variables, resituating these in the context of the space-time dynamic.

If I could pursue this line of thought a little further, I would say that this is the point at which to reintroduce the idea of freedom, choice and doubt.

I think that one of the major problems today is the fact that we have, on the one hand, a body of experts who would dearly like to be considered the sole repositories of knowledge and, on the other, the majority of the population who, with no access to this famous knowledge, are all ready to put themselves into the hands of these experts. There is a real danger that these XXth Century experts become the new oracles whilst everyone else, somewhat lost, follows them blindly. One needs to dispel the mystery surrounding science and knowledge and recognise the fact that all information is subjective and that alternatives must therefore be discussed.

At the same time, I would like to introduce an element of freedom and thus too of doubt and uncertainty and I would willingly assign to education the task of developing the ability to accept the existence of the uncertain rather than inculcating any one particular certitude, no matter what this was.

The third idea that I would like to suggest is that what is more important than the transmission of information and knowledge, is the development of each individual's ability to think, understand, criticise, invent and initiate.

The development of these abilities implies a radical change of outlook with regard to the idea of knowledge and with regard to the idea of action.

With regard to the idea of knowledge, it implies that we realise its highly partial, relative and changeable character. It is a platitude to say that our ignorance far outweighs our knowledge and that certain "truths this side of the Pyrenees are fallacies on the other". But this has never stopped us from teaching Sengalese the history of their ancestors the Gauls, nor from explaining to French schoolchildren, many years after Hiroshima, that the atom was indivisible. There are, we are told, truths which are best left unsaid: this was the case with regard to sex until this became a subject for public exhibition, and it was also the case with regard to Nazism, until the day the invasion began.

It is impossible here to deal in detail with the problem of knowledge, ignorance and uncertainty, but it is quite certain that any teaching system based solely on the transmission of knowledge provides a poor training for individuals who will be increasingly faced with uncertainty and half-truths.

With regard to the idea of action, this is certainly not the place to repeat the criticism of ideas which have prevailed ever since Taylor decided to go one better than the Cartesian ideas of rationality. However, as our conclusion, we would emphasise how essential it is that the freedom of thought, mentioned earlier, should be combined with freedom of action, which implies the right to show initiative and the right to make mistakes.

What education needs to concern itself with now is to develop amongst individuals a new capacity to be free and responsible.

THE FUTURE OF EDUCATION: A GLOBAL LONG-TERM PERSPECTIVE

by Harold A. Linstone

I. The uncertain future

Nearly every futurist believes that the industrial nations are about to experience major cultural change. Optimists like Herman Kahn see the advanced countries at an "inflection point" on their economic growth curve - a point at which accelerating growth stops and decelerating growth commences (see Figure 1). The next two hundred years look good and by 2176 he envisions a per capita gross world product of US$20,000 (1976 dollars). Pessimists like Robert Heilbroner see no hope of "meeting the challenges of the future without the payment of a fearful price"[1]. A major difference among futurists appears to involve the duration of the leveling-off period and the asymptote being approached. Is the duration 25 years or 200 years ? Can only the rich achieve a high per capita GNP and are they already close to the maximum, or can all reach a per capita GNP three times that of today's affluent societies ?

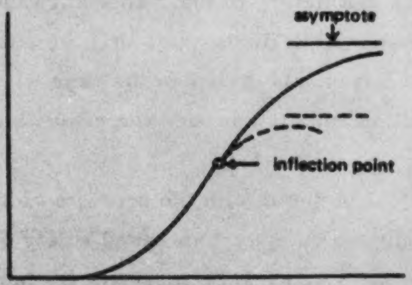

Figure 1. The S-shaped growth curve

An even more intriguing question is: what happens after the leveling-off? There is talk of a "steady state" society, but most futurists agree that such a state is unnatural. Evolution appears to operate in a series of cascading S-shaped curves, each leveling-off leading to a jump onto a new curve (see Figure 2). Thus the anticipated declining growth in industrial societies, i.e., economic growth, will be followed by a new kind of growth which will ultimately be seen to strive for a much higher level of societal evolution. The transition from one curve to the other may well prove to be a traumatic experience.

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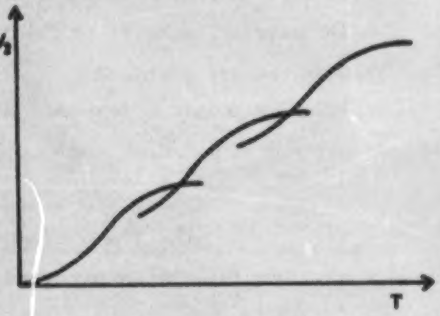
[1] H. Kahn, Speech given at alternatives to growth conference, October 1977, The Woodlands, Texas. R.L. Heilbroner, "An inquiry into the human prospect," W.W. Norton and Co., Inc, 1974, p. 136.

Figure 2a. An evolutionary sequence of growth curves



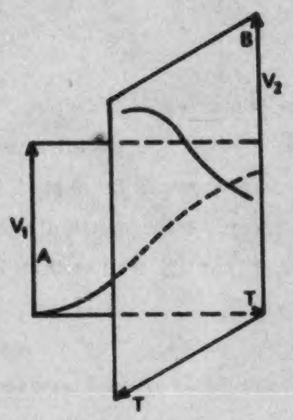


Figure 2b. Three-dimensional presentation of growth curves. Each curve represents a different type of growth, hence must be measured by a different variable

An effective planner must assume that the future will not be surprise-free, i.e., a simple extension of trends in the recent past. I will therefore consider the challenge to education on the assumption that the transition to a new kind of world will occur during the lifetime of our children and grandchildren and that the primary function of education is to enable them to negotiate the transition with as much grace and humanity as possible. They will be able to direct and control the changes only in part. And the education system must not assume that the future is predictable. Human societies are self-organizing and self-reorganizing. I am suggesting that we have experienced a period of stability and that indicators are pointing to signs of growing instability. The instability will exacerbate until a major change occurs which then initiates a new period of stability. We are surrounded by valuable clues, but we do not 'see' them in proper perspective and thus cannot confidently predict the nature of the new stability (or the new S-shaped growth curve).

I would suggest the following warning signs:

- Excessive concentration of power at the national level,
- Governmental inability to manage today's complex societal systems,
- Rapid depletion of natural resources,
- Incompatibility of incentives (profit, personal material well-being) with environmental conservation,
- Subtle shift of responsibility from the individual to the society,
- Information overload,

- Failure of economics as a 'science',
- Overreliance on science paradigms (reductionism, quantification, 'solutions', reliance on mathematical models of social systems),
- Bureaucratization and rigidity of institutions (19th century institutions to deal with 21st century problems).
- Illusory growth widespread (social costs somehow become increases in GNP, e.g., cleanup of pollution, auto accidents).

II. The challenge to education

Let us now interpret this impending transition in terms of challenges to education.

1. Demythologizing science

Science is the religion of modern man. Its success in the last two centuries is indisputable and awe-inspiring. But, as evolution teaches us, "nothing fails like success". Science has achieved its success by focusing on "well-structured" problems - problems which could be abstracted from reality by using a small number of variables. Reductionism is the key. Mathematical models are created which prove to be adequate representations of the 'perceived' reality in that they lead to results which closely approximate those achievable in a laboratory.

Another important characteristic is quantification of the variables. This means that models can be analytic rather than geometric and permits exploitation of very sophisticated analytic techniques. Objectivity is considered crucial: the scientist must remain outside of his analysis and experiments. The student is taught to define the term 'probability' objectively as the limit of the ratio of successes to total trials as the number of trials approaches infinity. There is no opinion or feeling tolerated.

The 'well-structured' nature is also reflected in the problem-solution concept. Reductionism leads directly to well-defined 'problems' and these have 'solutions'. The school textbook has easily identifiable problems which all have solutions.

The difficulties began when these successful concepts were carried beyond the realm of science and technology. Reductionism, quantification, and the other paradigms of science were extended to 'ill-structured' problems, specifically those involving human beings individually or as societies. Mathematical modeling, relying on a few quantifiable variables, became de rigueur. Psychometrics and economics, game theory and systems analysis were 'in'. As Daniel Yankelovich observed:

> "The first step is to measure whatever can be easily measured... The second step is to disregard that which cannot be measured or give it an arbitrary quantitative value... The third step is to presume that what can't be measured easily really is not very important... The fourth step is to say what cannot be easily measured really does not exist."

World War II accelerated this trend with its unprecedented application of large-scale technology to weapon system development and operations.

By the 1960s the limitations became apparent. Cost-benefit analysis, quantitative models of the Viet-Nam conflict, the Great Society analyses in the Johnson administration, and Forrester's urban dynamics exemplified the heroic efforts and, alas, failures.

There are important lessons here for the education establishment. Earlier generations were taught subjects such as Euclidean geometry with the conviction that it represented the 'truth'. Today we recognize that Riemannian and Lobachevskian geometrics are equally valid. Each is founded on a set of axioms (one set not necessarily consistent with another) and the resulting theorems are 'true' only with reference to the axioms used.

No model is reality; each model is at best one view of reality. The situation is not as schematically depicted in Figure 3, but rather as shown in Figure 4. The latter figure tells us quite clearly that objectivity is an illusion. The observer cannot divorce himself from the modeling process. Another conception of the situation is shown in Figure 5. Thus we must place greater stress on multiple models and on the unavoidable subjectivity. By multiple models we mean not merely alternative mathematical models, but full attention to models not founded on a quasi-technological perspective. An illustration is provided by the Allison models, characterized as shown in Table 1. Furthermore, qualitative study is as important as quantitative analysis. As James Thurber said, "There is no safety in numbers, or in anything else."

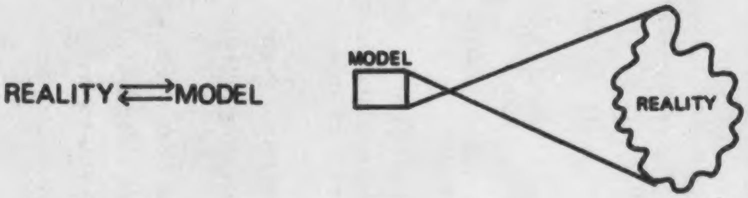


Figure 3. Traditional views

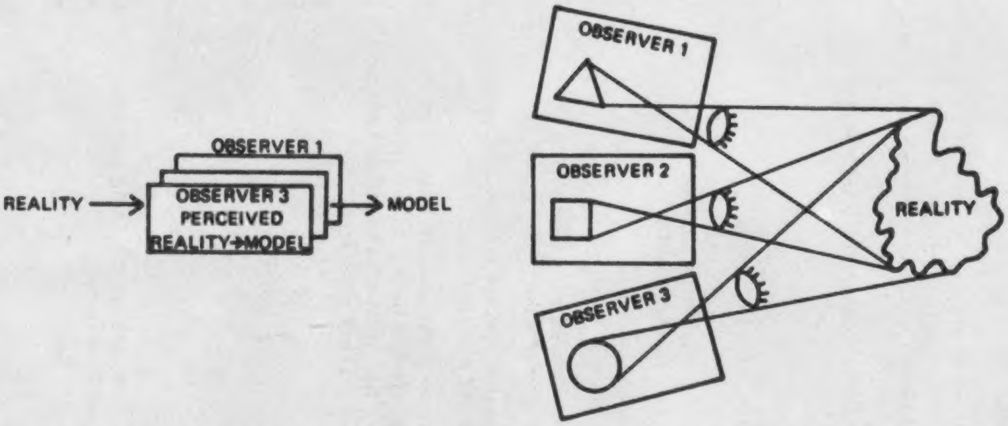


Figure 4. Non-traditional views

Next, we must create a better balance between reductionism and holism. Carrett Hardin

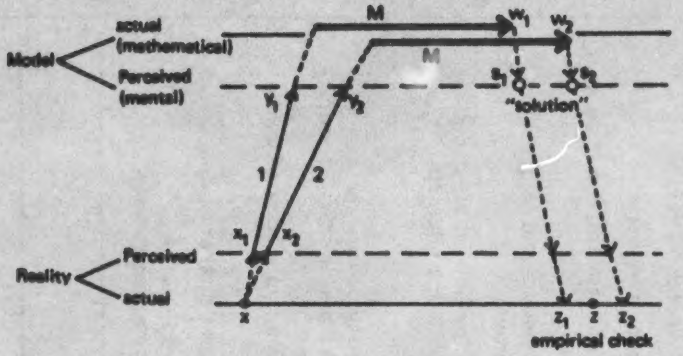
Table 1. Allison's three models

	Rational actor	Organizational process	Bureaucratic politics
Basic unit of analysis	Action as choice of total system	Action as organizational output in framework of present capabilities and constraints	Action as political resultant (bargaining, compromise)
Emphasis in system view	Quasi-technological	Social	Behavioral
Organizing concepts	Unitary decision maker (e.g., government) One set of goals (e.g., national) Problem as seen by unitary decision-maker Solution a steady-state choice among alternatives Action a rational choice based on goals/objectives, alternatives/options, consequences, and value maximizing selection	Constellation of loosely allied units topped by leaders Problems factored; power fractionated Parochial priorities Goals are constraints defining acceptable performance of organization Sequential attention to goals Standard operating procedures (SOP) Programs and repertoires Avoidance of uncertainty Problem-directed search Central coordination and control	Players ("where you stand depends on where you sit") Parochial priorities and perceptions Goals include personal interests Players' impact based on relative power Action channels structure the game Rules sanction some tactics (bargaining, coalitions, bluff) but not others
Dominant inference patterns	Actions are maximizing means to achieve ends	Behavior of organization at time t similar to t - 1, at t + 1 similar to t	Action resultant of bargaining game among individuals, groups

Table 1. (cont'd)

	Rational actor	Organizational process	Bureaucratic politics
General propositions	Likelihood of any action results from a combination of relevant values and objectives, perceived alternatives courses of action, estimates of various sets of consequences, and net valuation of each set of consequences Increase in costs of an alternative reduces likelihood of its selection Decrease in costs of an alternative increases likelihood of its selection	Standard routines: program is a cluster of SOP's satisfying rather than maximizing (first acceptable rather than best alternative) Long-range planning institutionalized, then disregarded Incremental change Trade-offs neglected Organizational health implies growth, imperialism Administrative feasibility a major dimension Directed change possible when organization is in crisis	Peculiar preferences and stands of individual players Styles of play vary Face of issue differs from seat to seat Fuzziness useful to get agreement Focus on immediate decision rather than on doctrine Views: Looking down - options Looking sideways - commitment Looking up - show of confidence Frequent misperception Misexpectations Miscommunications

Source: G. T. Allison, The essence of decision, Little, Brown and Co., Boston, 1971.



Observer "1" perceives the reality x as x_1, "2" perceives it as x_2. "1" perceives the model M as y_1. "2" sees it as y_2. The model M is exercised and the output w_1 and w_2 is misread by "1" and "2" as s_1 and s_2, respectively. Either is taken as solution to the perceived problem, to be further misinterpreted (z_1, z_2) as the real world behavior z.

Figure 5

noted that "what is true for a part is not necessarily true for the whole". The whole is not equal to the sum of its parts.

Unfortunately, the very organization of education militates against a holistic perspective. Problems are categorized in terms of disciplines - there are physics problems and economics problems. As such, they fit into the departmentalized school organization. Interdisciplinarity is seen as a threat to the dominant organisational structure. At best it is misinterpreted as multidisciplinarity: two departments may cooperate to do research or teaching.

Finally the student is brainwashed to believe that we solve problems when in most instances of complex problems we 'shift' problems. Any 'solution' gives rise to new problems: reduction of the death rate by public health advances increases the overpopulation and underemployment problems. Improved communication raises threats to privacy, etc.

Our blind adherence to the paradigms of the age of science and technology when we deal with human and social problems cannot be condoned in future educational approaches. False idols such as objectivity and quantification must be unmasked.

2. An expanded space-time horizon

It is a human characteristic to apply a discount rate to the future (see Figure 6) and to the past. Interest is focused on the present. Similarly, events which occur physically far from us are of much less interest than those which take place in our immediate neighborhood. In other words, we discount in both space and time dimensions.

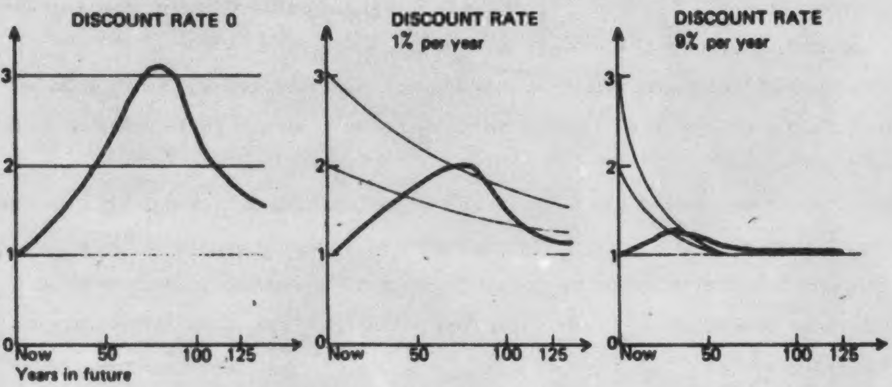


Figure 6. The discounting phenomenon in the case of world population, based on Meadow's Standard Run (The Limits to Growth, Universe Books, New York, 1972, p. 124, Fig. 35), (1970=1).

In a vast, uncrowded, slowly changing world this tendency is most reasonable; in a crowded, rapidly changing and shrinking world it is very hazardous. It is equivalent to speeding down a busy, but unlighted, mountain road at night with low beam headlights.

It would be inconceivable that students learn about their own nation but are kept ignorant about the rest of the world. But even in physical space a discount rate is still applied to distance so that their familiarity with other cultures is inadequate. The situation is much worse with respect to the time dimension. School curricula have always dealt with the past, but ignored the future. The continuity of past-present-future is lost in the compartmentalization of subjects. I believe that much can be done to increase students' awareness of future problems and alternatives, i.e., extending their planning horizon (Figure 7).

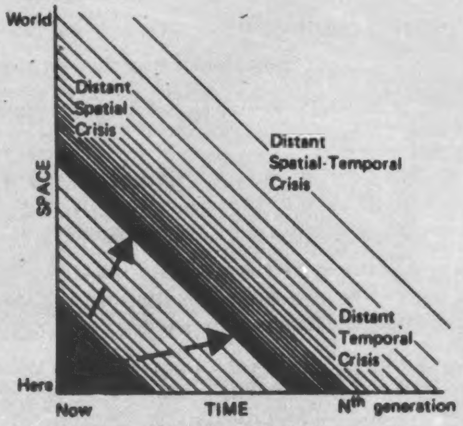


Figure 7. Extending perception out

3. Localization and globalization

Nationalism is the dominant political concept in today's world. Concentration of power at the national level is dangerous when problems cannot be solved at that level. Some writers have stressed decentralization or partial uncoupling (e.g., Vickers[1], and Voge[2]), others globalization (e.g., Falk[3] and Laszlo[4]).

Decentralization facilitates more effective movement of information than does a strictly hierarchical arrangement. It is well recognized, for example, that the national government often has a very poor understanding of local needs.

Globalization facilitates effective management of basic resources such as water, food and energy. One nation's efforts at pollution control of the seas are of little value if the others permit unrestrained pollution.

The educational system has been a very important tool in developing a nationalistic citizen. It has been much less effective in creating the responsible world citizen and the communal citizen. It is my conviction that a strengthening of both ends of the spectrum is necessary (Figure 8). To this end youth must be sensitized to the value and potential of the local community on the one hand and the global entity on the other.

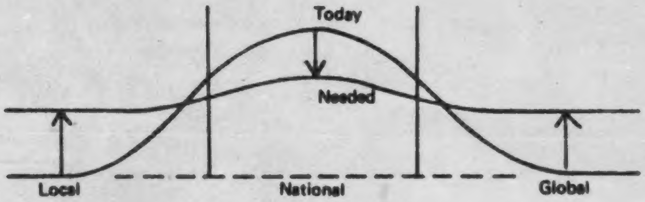


Figure 8. The balance of power

Technology helps and hurts this process. Increased mobility facilitates a global perspective, but also causes rootlessness and thus disinterest in the local community. Again the challenge for the education system is apparent.

We are tempted to add to this discussion the extreme of localization: the individual. Just as we have seen an excessive shift of responsibility from community to national government, so we have witnessed a shift from individual responsibility to group responsibility. In Nazi Germany following orders was the excuse for the most inhumane behavior on the part of individuals. As long as Hitler accepted full responsibility the individual felt himself to be in the clear (with few notable

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1. G. Vickers, "The future of culture", in H.A. Linstone and W.H.C. Simmonds (eds.), Futures research: new directions, Addison-Wesley Publishing Co., Reading, Massachusetts, 1977.
2. J. Voge, "Information and information technologies in growth and the economic crisis", in Technological forecasting and social change, Vol. 14 (1979) (to be published).
3. R.A. Falk, "A study of future worlds: designing the global community", Free Press, New York, 1975.
4. E. Laszlo, "A strategy for the future", G. Braziller, New York, 1974.

exceptions). In Western democracies today the parent often places the blame for the child's poor study habits and poor academic record on the school system. The criminal blames society for his behavior; the bankrupt businessman blames the government for inadequate protection against competition.

I would suggest that one of the most vital challenges to educators is to instill a sense of personal responsibility in students. Rights cannot exist without responsibilities. Population and pollution control as well as conservation are largely individual duties.

4. Education and bureaucracy

Education systems everywhere are among the worst examples of bureaucracy. We have already referred to compartmentalization as a by-product of the age of science and technology. Specialization achieves its zenith in the Ph. D. dissertation and disciplines rather than problems determine academic organization. A child entering school is open to 'problems' and is not concerned with labels. By the time he or she has graduated from college, brainwashing has had its effect. A 'problem' is now immediately characterized as a physics problem or an economics problem, i. e., identified with a discipline.

In 1961 Christopher Jenks warned that "the most damning single factor today is that among nearly 2,500 accredited and unaccredited institutions there seem to be fewer than half a dozen radical experiments dedicated to testing new conceptions of what college life, and hence adult life, are capable of becoming".[1] Interdisciplinary and transdisciplinary programs[2] have had rough times in department-dominated high schools and universities - in most cases they prove to be valiant, but shortlived efforts and their chance of survival is further reduced in a tight-money environment[3].

The last major change in knowledge transfer fully accepted and exploited by the educational establishment was the printed book. This and the 2,300 year-old lecture, discussion, and problem-solving concepts of the Greek academy have comprised the tools of knowledge transfer for centuries.

The rational planner would think that the situation can be readily alleviated by dismantling the educational bureaucracy and creating new, more flexible and future-oriented educational systems. However, what appears reasonable from the standpoint of the "rational actor" is most unreasonable from the perspective of the "organizational process". As Table 1 suggests, the latter perspective implies very different goals, the primary one being stability and perpetuation of the existing establishment. Until failure can be demonstrated very clearly, i. e., until the system instability becomes sufficiently severe, the organizational process can resist any major change successfully.

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[1] C. Jenks, "The next thirty years in colleges", Harper's, October (1961), quoted in Kaiser aluminum news, Vol. 25, (1967), No. 1.

[2] E. Jantsch, "Technological planning and social futures", Cassell/ Associated Business programmer, London, 1972, p. 223.

[3] With Jantsch we define these concepts as moving far beyond co-operation and superficial co-ordination among departments. They involve co-ordination by introduction of a higher level concept (interdisciplinarity) or multi-level concepts (transdisciplinarity).

In the meantime education systems are clearly faced with declining significance in the society, joining many corporations and governments as ageing relics basking in the nostalgia of days past when they provided dynamic leadership. And more education will take place outside the formal education system.

5. Ability to access information

In the recent past the ability to control energy has been the key to power. In tomorrow's society the use of information will be the key to power. The poor and weak will be less those who lack energy or material wealth than those who are unable to tap information. The rôle of education in developing the ability to access information will prove more important than that of imparting substantive information. Communications and computers are extensions of the human nervous system and the brain. As such they are far more significant than mechanical tools which are extensions of the muscles, arms, and legs. In the future a person who is literate but unable to access information via computer may be as handicapped as an illiterate person in an industrial society. In a generation the home without a computer terminal will be the equivalent of a home without a telephone today. The library of today will be as available to the individual in his home as weather and time information which can now be obtained by dialing on his or her telephone[1].

It is self-evident that techniques for accessing information in a computer and communications oriented society must be taught to young and old. It will soon be as necessary a skill as reading and writing.

The other side of the coin is information overload. Skill in avoiding this problem must also be acquired. Unfortunately the present higher education systems are contributing significantly to the overload. "Publish or perish" is still the rule. The current deluge of doctoral dissertations and government-sponsored studies exacerbates the paper pollution. Quantity is substituted for quality. The more time is spent writing, the less is available for reading and thinking. Consequently, duplication increases and the number of important ideas per page decreases.

As noted earlier a change in the organizational process is not likely until the danger of collapse of the system becomes much more vivid.

6. Lifelong learning

In a period of rapid change and extended life span the value of lifelong learning is obvious. The confinement of education to the young becomes as inappropriate as would be the delivery of health services only to a certain age group.

Stanford University recently awarded a Ph.D to a 65 year old man and Portland State University did the same for a 73 year old woman. Education is inevitably becoming a significant activity for older persons as their period of retirement expands.

Multiple careers are a consequence of rapid change. Retraining is essential as obsolescence overtakes certain types of work and new opportunities are created.

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[1] G. Kemeny, "Random essays on mathematics, education, and computers", Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1964, pp. 134-156.

George Bernard Shaw said that youth is a wonderful time but it is unfortunate to waste it on children. We do not yet have the Faustian power to provide eternal youth. But there is no reason to constrain a man-made system such as education to serve only the needs of children. Considerable progress has already been made in this area but much more can be done.

An interesting example which suggests the potential is a two-way cable television experiment carried on by the NYU-Reading Consortium for the National Science Foundation. Three neighborhood communication centers were established in Reading, Pennsylvania, of which two were placed in senior citizens' housing projects. Two way video communications were established. Converters were also placed in 117 elderly citizens' homes and subsequently programmes were transmitted on the local cable TV channel (35,000 subscribers). The offices of the mayor, city council members, and county commissioners were also connected. The senior citizens were responsible for programming and the resulting participation and interaction of the elderly was highly successful[1].

III. Final thoughts

In conclusion, any long-range global perspective should focus on three points: (i) What should education do? (ii) What can education do ? (iii) What can education not do ?

The primary function of education should be the preparation of young and old for the future as individuals, as societies, and as citizens of one world. We must feel more comfortable with uncertainty and more competent to exercise partial control in navigating the rapids of transition. We cannot today see the details of the calmer stream and the banks beyond the rapids. But we can learn to manœuvre so as to minimize the likelihood of overturning and to swim and hold onto the boat in case we do.

Education can do much - provided it is not too busy teaching the people in the boat to walk.

An old saying states that the military are always planning to fight the last war over again with better weapons. Similarly, the educational establishments are usually planning to educate a new generation to live more successfully in the present or recent past.

Unfortunately, the guaranteed way to crash against the rocks in the stream is to be looking backward.

We cannot expect the learner to be flexible when the education is rigid. New technology has a tremendous potential, but it is not a panacea. No specific guidelines can be given for the many educational systems. Chinese "May 7 peasant colleges"[2] may be exceedingly valuable for rural cultures, but unsuitable in urban settings. The Linstone concept of the new university[3] could be appropriate for urban societies, but not for rural cultures.

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1. M.L. Moss, "Two-way cable television: an evaluation of community uses in reading, Pennsylvania", the NYU-reading consortium, New York University, Alternate media center, School of the arts, Graduate school of public administration, April 1978.
2. J.N. Hawkins, "Rural education and technique transformation in the people's Republic of China", Technological forecasting and social change, 11 (1978), p. 235.
3. H.A. Linstone, "A university for the post-industrial society", Technological forecasting, 1, (1970), pp. 263-281.

Finally, we should consider the recent conclusions of Aurelio Peccei, founder of the Club of Rome and Harrison Brown. In his recent book "The human quality" Peccei writes:

> "There cannot be any salvation unless people themselves change their values, mores and behavior for the better... It is only by developing adequately human quality and capacities all over the world that our material civilization can be transformed and its immense potential put to good use. This is the human revolution, which is more urgent than anything else...".

And Harrison Brown in "The Human future revisited" sums the situation up as follows[1]:

> "In the absence of our injecting dramatically new attitudes and actions into the world system, industrial civilization seems headed for extinction".

Can we expect to change human nature ? Probably not. But let us recognize that we have hardly reached the limits of human mental capacities. Education must deal with man's unexplored inner frontiers. As Jean Houston has noted, we are using only a small fraction of our mental capacities.

> "Most people, given the opportunity, given education, can realize more of their potentials in varying degrees. They can learn to think, feel, and know in new, unaccustomed ways...Once we understand the generally unrecognized limits we impose on ourselves by a myriad of false concepts, shrunken aspirations and taboos, we become able to achieve a larger freedom to think, to dream, to aspire, and to experience...[2]

Faith and hope compel us to anticipate man's continuing, albeit uneven, evolution. We feel much less certain whether progress will occur because of, or inspite of, formal education.

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1. H. Brown, "The human future revisited: the world predicament and possible solutions", W.W. Norton and Co., New York, 1978.

2. J. Houston, "Prometheus rebound: an inquiry into technological growth and psychological change", Technological forecasting and social change, 9 (1976), p. 257.

EDUCATION AND DEVELOPMENT: SOME REMARKS ON PRIORITIES AND CHALLENGES FOR FUTURE INTERNATIONAL ACTION

by Henri Dieuzeide

> "This is the transcript of a largely extempore communication to the International Conference on Learning Tomorrows held at the University of Massachussetts in April 1978.
>
> It is not meant to cover exactly the subject area of the present meeting and is only presented as a partial contribution to the discussion."

We may wonder where to place this 'future of education' we are gathered here to discuss. Has not the year 2000 - which is so often proposed both as a myth and as a target for studies in the future - already been pledged ? More than half of the decision makers, teachers and administrators in education who will be active in the year 2000 have already been trained today and one may rest assured that, whatever futurologists may say or write, their own psychological inertia, combined with the stability of the system will protect educators from promoting any radical change throughout their professional lives. In most industrialised countries, recruitment of teachers is coming practically to a standstill after the enormous intake of teachers called for by demographic pressures since 1945.

The orientations we give to teacher trainers will have an influence on education as far as the year 2000, as they will train teachers until 2020, who in turn will teach until 2060 and their pupils will still be in active life in 2100.

This shows that today's basic educational decisions may still retain their influence 120 years hence. It also shows how present the past can be in education: we ourselves are in a way a product of the year 1860 (which may explain a lot!). Indeed, there is a crying need for a critical evaluation of our present decisions in the light of what the future is going to mean, But, to be useful, we should not hesitate in setting our targets further ahead than the year 2000. How far ?

This may not be easy to define. We should probably think in terms on a continuum rather than of fixed targets. Education establishes strongholds of the past in the future. Art, history and science bring all the messages of the dead to shape the unborn. But who today is going to speak on behalf of the unborn ? In education as in natural resources we are preempting the future and they - the unborn - cannot stop us. Can all those studying the future of education take provisional responsibility to stand up in their own defence - and how ? Supposing they are willing to take this responsibility, are they equipped to do so ? If we were to establish a world map of futurological resources in the field of education, we would be struck by the enormous disparity between capacities available in different countries. The geographical index of the Guide for Organisations and projects for the study of the future published by the World Future Society in 1977 shows that practically all specialised institutions are located in industrialised countries and that nine tenths of them work in the United States of America on developing American models of the future, not likely to be accepted by most countries. Let it be said that we, in Unesco, at present are aware of less than half a dozen institutions working specifically on the question of the future of education for developing countries, the most active to our knowledge, being located in India, Mexico and Senegal. Can American futurologists take the responsibility for all unborn children of the twenty first century ?

Why have so few countries evinced interest in this field so far ? If we look in retrospect at what has been said and written over the past twenty years on the future of education, now that part of it has become the present, we must admit that not much of it was reliable. In my contacts with various Member States I have often heard charges of dilettantism fictionality, or irresponsibility levelled against studies on the future, sometimes implying regret at seeing resources that could be better applied elsewhere wasted there. The status of studies on the future of education in most countries, its influence on decisions of governments and educational authorities, on behaviour of teachers and on expectations of parents is not high and its impact hardly felt.

This is not entirely the fault of those specialists dealing with the future of education, for there is little agreement amongst educationalists on the present of education and the fundamental meaning of its tremendous expansion to date. Some view education as a passive subsystem of the socio-economic environment. For others, it is a powerful tool in promoting socio-economic change. Yet others, can only interpret education in a non-economic perspective, as either passively reproducing the authority pattern and values of existing societies or as a forceful instrument for 'conscientisation' and enrichment of ethical and cultural values. Was the expansion of education in the fifties an automatic response to the requirements of economic expansion, or was it a strong social pressure originating in individual aspirations ?

New thinking may be needed both for the present and future rôle of education in a worldwide perspective. This is all the more true in that there are, at present, signs of change of interest in Member States on the future of education. At the turn of the century, less than two per cent of GNP was spent by developed countries on educational activities of any description. At present, developing and developed countries alike spend sometimes up to ten per cent of the GNP. For the past twenty years, assigning resources to education has been one of the top priorities with most developing countries. Now, all over the world, there is a slowdown on investment although there is no explicit foundation for it. There seems to be a degradation in the political will of nations and their commitment to educational activities.

This reticence stems from the fact that education's relation to economic growth, employment, manpower needs, reduction of social inequalities, to give only a few examples, is considered more and more by decision makers as a complex and not too well explored field of interacting forces often involving negative long-term economic, social and cultural consequences.

This disenchantment is similarly reflected in the new pattern of thought which is gradually emerging in the community of nations and which is also being experienced in the United Nations system by reason of a wealth of studies, discussions, deliberations and recommendations. These all swing towards the establishment of a new economic order between nations, a strategy to meet basic human needs, the launching of a 'third development decade' devoted to identifying more appropriate models for development, a programme of technical co-operation between developing countries, etc.

Such perspectives are no longer based on the projections or exponential growth of the early fifties, but on considerations of the limit of physical resources (Club of Rome) on the structural crisis of employment (World Conference on Employment) on the growing gap between industrialised and developing countries (new economic order - Group of the 77).

These views underline the dangers or impossibilities in pursuing growth as previously conceived and to identify new strategies, not for growth alone, but for development conceived as a comprehensive multi-relational process involving all the aspects of the life of a community, its relations with the outside world and its self-awareness. It is worth noting that, in this respect, education is hardly mentioned, at least as a central element, either by the 2000 year programme the Strategy of Basic Needs or the Consultative Group of the World Bank and there are many implications that nations may have to attend to more urgent tasks than looking at their educational systems. We may, in most countries, be entering into a zero growth period for education, if not a period of decrease.

This is a very serious and new development in education which will certainly have important consequences for its future. Of course, it may be that educators will become alarmed in many countries and try to mobilise their forces to convince communities and governments to maintain their present efforts in traditional directions. It may be that we have reached the stage where new concepts and new strategies of education will have to be developed to cope with these orientations, for the new approach to development and growth has brought to light a new set of values in the international community which stress such fundamental principles as self-reliance, protection of cultural heritage, integration,balanced interactive processes of development, endogenous development, commitment and participation of populations in their own development. These tend now to be accepted norms for international co-operation. The United Nations system would only consider futurological hypotheses, that would appear compatible with these norms.

Within this framework, objectives of futurological studies in education become clear. If there are growing inequalities in international life and if the ratio between capital income can be as much as one to one hundred within countries and between countries, inequality is even worse in terms of knowledge and culture. In developing countries, there are more than 800 millions of illiterates and their number is increasing. In 1976, about 150 million children between the ages of 6 and 11 received no schooling ; inequality between the sexes is still a reality in schools in many developing countries.

Which kind of education of the future within countries and between countries would help reduce these inequalities ? Where and which are the international strategies by which education could be developed which would respect at the same time the diversity and the unity of the world ? If most world problems are in practice closely bound up with each other - human rights, peace, population growth, control of natural resources, economic development - it is obvious at the same time that societies display the greatest diversity. Some of this originates in economic disparity, but part of it also stems from deliberate efforts of countries to protect their identity, their language, their cultural characteristics, their way of life, their inter-relationships. How is international co-operation to contribute to the long-term educational construction of a society capable of satisfying the needs of its members in accordance with its accepted system of values ?

One particularly urgent question is that of how to help newly independant countries divest themselves of the left-overs from educational systems of the former colonial power and successfully integrate cultural heritage and modernity. A second question is that of how to reduce to a minimum the risk of being undemocratic, or paternalistic in any long-term forecasting exercise which processes centralised information. How can participation of those concerned in designing their own educational futures be ensured. A third question is that of how to develop concepts of education into integrated overall projects: to associate individual satisfaction of basic needs, the national goals of self-reliance and cultural identity and the international order with its implications in terms of international trade. These are, at present, reduced to a few quantitative parameters, the rest being abandoned in the face of the complexity of interactions and qualitative aspects of the development process and the radical changes it entails.

What use should be made of economic, sociological and political theories in studies of the future ? In what terms ? The long-term future of education will look extremely different depending upon the approach adopted: conservative, based on manpower forecasting; reformist, aiming at planned structural changes, or radical, based on conflict, 'conscientisation', power theories.

Could we dream of studies which will develop an approach based on a minimal consensus - some kind of futuristic oecumenism resulting in methods flexible enough to lead to practical solutions. For instance, most countries are at present faced with two opposing trends in education: one aims at modernising, that is at applying a model through programming, centralisation and rationalisation of efforts. This application is based on the widest possible dissemination of standardised products scientifically designed in order to generalise knowledge as quickly as possible on a nation wide basis. It feeds on the vision of a world inspired by competition and productivity. The second trend aims at revealing individual potentialities as yet unexplored, identified or used and is often called 'conscientisation'. This is based on new processes of interaction between individuals, development within groups of their own values and objectives in order to unleash creativity and recognise divergences. Some critics of this second approach consider that the development of divergent self managed learning micro societies will inevitably become incompatible with the more authoritarian national scientific educational systems. To what extent will these trends coexist in the future? Can organisation and innovation inter-react better than they are doing now and fertilise one another and, by so doing, provide some models articulating formal/non formal / informal education patterns of activities. There are signs that governments will invest more in activities of a less formal and more cultural nature, more decentralised, more community based, whether in the perspective of rural or urban development. More long-term studies are needed in this respect to help countries better perceive the far reaching consequences of their choices of today.

The search for the same basic consensus on learning futures could probably apply to questions such as :

(1) since learning is not confined to schools, how can productions activities of society be turned into sources of learning (whilst bearing in mind the constraints of existing arrangements) - how can the use of resources and various educational agents be diversified and various pieces be integrated into a new system which would be an educational system and not only a school system ?

(2) since new variegated and flexible structures are needed for lifelong education, how can coherence be given to the various elements of the educational system in order to ensure, on the one hand continuity and on the other, mobility, each terminal stage being also a preparatory stage ?

(3) how can an educational system be devised which would better control interaction between science and society and reduce to a minimum the destructive impact of technology upon endogenous cultural values ?

(4) how can formal education - the school part of the system - be restricted to a few fundamental rôles - learning to learn; developing creativity; relearning silence - and finding ways and means to reorient the incoming flow of additional functions to other non formal sections of the educational system, such as the media ?

(5) how can maladjustment between education and employment and their future relationship (education for work - occupational training) be reduced ?

Other studies could usefully be undertaken with international organizations as they involve their own future, for example on the rôle of international co-operation and the strategies of external assistance for long-term educational development.

Let's be realistic. We are not living in a world of harmony and peace: violation of human rights, racism, apartheid, oppressed minorities, science and technology divorced from human welfare, nihilistic feelings, violence, unemployed youth bereft of the possibility to live in dignity, sales of armaments to poor countries and threats to peace.

What is quite clear today is the lack of social consensus or, rather, the realisation that there is no social consensus. 'Delegitimization' of leaders and parties, egalitarian aspirations and self management are the order of the day in most countries. In education in particular, it would seem that values that were the clothing of traditional authority such as 'respect', 'deference' and 'decency' have become obsolete in most cultures and that social relationships based on violence and oppression, whether physical or symbolic, are more clearly perceived and interiorised.

Dissatisfaction with schooling is only one aspect of this new attitude. I do not think that refusal to accept individual failure in schooling should be mistaken for a refusal of education in total. That there is no deference for teachers or no respect for school life conventions any more does not mean there is no individual aspiration for improvement.

What strikes me, on the contrary, is the frantic *libido sciendi* today, desire to know and understand and, in developing and developed countries, testifying to the formidable pressure to become master of one's own destiny.

One is actually lead to wonder if 'delegitimization' of authority in many Western countries and the hunger for schooling in the Third World could not be two sides of the same coin.

For lack of social consensus does not exclude a *de facto* solidarity. If international organisations cannot make up for the lack of consensus, they can help with solidarity. It is this *de facto* solidarity of mankind that studies on the future of education should explore.

Unesco is not a research institution or a University, but a world-wide organisation concerned with education, science and culture. With 146 Member States and thirty years of experience in intellectual co-operation and operational assistance to these Member States, it is in a position to help a truly international movement on studies on the future of education.

The organisation itself foresees two major activities in the field of future studies in its own programme: one will aim at preparing for the International Conference on Education which will be held in Geneva in 1981 - a general report on prospects for the development of education policies and planning in Member States during the coming decades, with priorities for international co-operation in education which is to be prepared with the help of a pahel of eminent educators, scientists and specialists in culture. The other is a plan to convene an international conference of personalities in the fields of science and the arts to examine desirable trends in content of education for the future and make recommendations to the international community in this respect.

This is an effort with a world-wide orientation and a global meaning. Groups meeting on occasions like this Conference on the future of learning could be associated with this new international programme on condition that it would really be oriented towards a critical examination of world-wide evolution. If Unesco, by virtues of its own action cannot alone reverse the trend, it can help introduce the true dimension of the future - of their future, into the thinking of most countries of the world about what their education may mean for the future.

It seems to me that concerted international action could develop immediately in four practical directions:

(1) improve intercommunication between institutions concerned with the future of education, as we are under the impression that if some important people correlate very well, the middle level academic and research staff does the real work in isolation: development of some kind of networking would, therefore, seem to deserve consideration;

(2) it seems that there is no methodological consensus, not even an acceptable typology of methods, and an exchange of views and possibly guidelines, if not a charter, might prove useful;

(3) with the assistance of institutions such as these, Unesco could also foster development of autonomous research capacities on the future of education in developing countries;

(4) in view of the fact that future studies have not triggered off serious international discussions on possible models, with perhaps the exception of the Club of Rome, Unesco could assist in introducing a better international critical dimension by relating them to other research and training projects in the specialised fields of its competence. Such discussions could possibly improve the attitude of educational authorities towards future studies which, in turn, could mean that the dimension of the future will at least be introduced in long-term planning and decision making in education.

Obviously, all these practical arrangements could contribute to the establishment of a working infrastructure which would bring about a confrontation of different futurological perspectives in education in different countries, the results of which Unesco would hope then to report to the IBE Conference in 1981.

What is most needed is the development of serene, dispassionate studies capable of standing searching international discussion. Flamboyant opinions are not needed. What is, is a serious analysis of the long-term possible consequences of our actions and inactions of today.

PART FOUR

ENROLMENT PROSPECTS: EDUCATION AND EMPLOYMENT

Documents presented at the Seminar

FUTURE ASIAN EDUCATION

by Malcolm S. Adiseshiah

I. Some quantitative indicators

Future Asian Educational development will continue to rest on the massive quantitative base that it now rests on. With a population of over 2 billions constituting 72 per cent of the Third World people, Asia[1] will be entering the twenty first century with over 3.5 billion persons, but with a somewhat lowered annual average population growth rate, from the current 2 per cent to 1.8 per cent.[2] The impact of this population base on the education system is to be found in the structural and locational aspects of the population. Taking the age structure, 40 per cent of the population is under 15 years of age, (in contrast to the 25 per cent found in Japan and USSR) and its continuous increase in the eighties and nineties may be seen with reference to the primary school age group of 6-11 years. This latter age group which increased by 26 million or 9.3 per cent in 1970-75 is now expanding by 31 million or 10.2 per cent in current quinquennium 1975-80, and will continue the trend by 36 million or 10.7 per cent during 1980-85. This means that even at current enrolment ratios (of around 70 per cent at primary, 33 per cent at secondary and 3 per cent at higher), school and college facilities will have to increase by 50 per cent in the eighties and double by the nineties. In addition education will have to be provided to about 200 million in the age group 6-17 and 350 million illiterate adults.[3]

Turning to the locational aspects of the population, UN projections show that the urban population which in 1960 was 25 per cent of the total population in East Asia and 18 per cent in South Asia, will in 1980 increase to 33 per cent and 25 per cent respectively in the two sub regions, reaching in 2000 43 per cent in East Asia and 35 per cent in South Asia. The present heavy rural preponderance of the education scene in Asia will be modified to some extent, and the problem of relevance of the urban-industrial oriented educational system to the agro-rural living of the people will not give rise to the same sharp conflict as it does today.

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1. Asia in this note covers the developing countries excluding Japan and USSR and in regard to some educational statistics does not cover China, Democratic Republic of Korea and Vietnam for whom such information is not available.
2. Population Bulletin of the United States No. A-1976 United Nations New York 1977.
3. Development of education in Asia - Statistical trends and projections - Unesco-Paris 1978.

There is another aspect of the current demographic profile that the eighties and nineties will have to deal with, and that is the lop sided discriminatory manner in which the educational system has developed as far as the rural people, who as noted earlier, are the majority people of the country, and women are concerned. Primary education facilities in the rural areas, where 70 to 80 per cent of the 6-11 age children live, are less than half of those available in the urban areas of Asia and their differential worsens at the second and higher levels of education. As far as education of girls and women are concerned, the enrolment rate of girls in the formal system is between 50 to 60 per cent of that of boys. And women's illiteracy rates have ranged from 80 to 90 per cent in Asian countries where over 60 per cent of the adults are illiterate and 45 to 60 per cent where men's literacy rates have varied from 70 to 80 per cent. These deeprooted educational imbalances are to be corrected in the remaining two decades of the current century.

Looking at the Asian system as a whole and its behaviour, unpredicted by its parts taken separately, the record to date (with some outstanding exceptions) is of a culture with low social synergy, of social structures which provide for acts and functions which are mutually opposed and counter active or counter productive. This is not to say that education and development of which it is a part is a single track unilinear forward movement. There are the normal interruptions, backing up and trade offs. The reference here is to the fact that the total system has in-built contrary forces, such as the expansion of formal schooling going alongside of increase in the number of illiterates, or accelerated GNP growth rates being accompanied by lowering of living standards of the mass of the people. Or again its working models not only fail to derive benefit from potential multiplier effects, they do not even generate additive effects. This may be because the projects and programmes particularly in the rural areas do not grow on their own momentum: they depend all the time on external inputs, when withdrawn just die off. The education sub system as much as the sub systems of soil conservation, or nutrition, or health care does not trigger self sustaining growth, has not promoted self replication. The task for the future in Asia is to develop adequate social synergy systems. In relation to the educational system this involves the development of new models based on new traditions and models.

II. Models - old and new

It will be recalled that Asia was the first major region to produce a continental Educational Plan[1] and the first to produce an Educational Model[2] in execution of the Plan. The approach in the Plan and model was based on a conceptual combination of education as a human right and its function as the generator of trained manpower. Three consequences followed. First was a rather spectacular expansion of education in the sixties and in mid seventies by around 100 million enrolled students. Second the model used the available quantitative tools, enrolment rates, wastage and repetition rates, teacher-pupil ratios, unit costs and using various mathematical formulae, targets were established for groups of countries for school enrolment for training and recruitment of teachers and the percentage of the Gross National Product should be expanded on education. Third in the actual working out of the plans and the models the manpower approach came up on top, resulting in priority being given in Asia to secondary and higher levels of education over primary education, to formal over all forms of non-formal education, and to feeding the small modern sector and neglecting the vast unorganised sector. (As an illustration of this last issue, it may be noted that of India's labour force of 240 million the organised sector employs 20 million including 16 million in its factories, and it is to this group rather than the 220 millions living and working in the unorganised sector that the education system is geared).[1]

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[1] Report on the Regional meeting of Asian Member States: Karachi UNESCO/ED/173, 1960.

[2] An Asian Model of Educational Development: UNESCO Paris 1966

The many assumptions on which the plans and models were based were one by one seen to be false. First the assumption that expanding formal education would make for accelerated economic development and welfare did not come true as the development that took place was in certain small segments of the population and in limited areas within each country. Second the assumption that increased formal education and high economic growth would liquidate illiteracy did not eventuate as not only did increased schooling and economic under development coexist with increasing numbers of illiterates, illiteracy itself became a major constraint universalising primary education and on the equitable sharing of the benefits of development. Third the institutions of higher education and training which were developed to meet the precisely calculated manpower needs in the manpower budgets of the models were found turning out not trained and skilled personnel that were employed by the economy, but a growing army of unemployed scientists, technologists and educated personnel at matriculation levels or above, ranging from 72 per cent of all unemployed in Sri Lanka to 10.6 million registered as job seekers in India's Employment Exchanges. Fourth it was assumed that an improvement in the pupil/teacher ratio, or an increase in the number of trained teachers, or of the proportion of non teacher costs to the cost of teachers salaries will help to usher in desirable educational reforms and improve the quality of education. In actual practice, most Asian countries have a fully trained teachers corp, and many have reduced pupil/teacher ratios without any reduction in their wastage rates, or their irrelevance problems. On the contrary, there are countries in the region where the class size has been increased, but because of the teacher's use of the learning opportunities as well as peer teaching, the wastage rates have been reduced. Finally the assumption that the government must allocate increasing finances to education (in the Asian model from 3 per cent of GNP in 1960 to 5-6 per cent of GNP in 1980) because only in that way will education be available equally to all people and will education make its contribution to income redistribution has proved to be false. One basic assumption of this plea for increased government funding of education is that government funds will be raised through a progressive tax system, from the rich who have the capacity to pay. In actual fact, in Asian countries, the tax systems are regressive, with the poor and middle income groups contributing through a multitude of indirect taxes to state finances. As noted earlier, despite increasing government finances allocated to education, moving from 2.45 per cent of GNP in 1960 to 3.04 per cent in 1973, the majority - the poor, the rural people and women - are outside the educational network but even worse the size and structure of governmental financing of education has made for further inequalities in income distribution. Free education, free boarding and lodging at the secondary and higher education levels benefit students from the upper income groups who form the majority at these levels of education. (In India field studies show that 80 per cent of secondary and university completers come from the top 20 per cent of society).[1] As a consequence, the combined effect of the regressive Asian tax systems and the distribution of education services among income groups, the increasing governmental financing of education instead of promoting equality, including equal opportunities, acts as a mechanism for the transfer of incomes from the low and middle income groups to the upper income ones.

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[1] Draft Five Year Plan 1978-83 pp. 81-105 Govt. of India, New Delhi, 1978.

It is against this background that new educational models are developing in Asia which are based on new concepts of development and which point to the directions of educational development in the coming two decades. Development in the sixties was defined in terms of a target rate of growth of the economy and its sub-sectors - agriculture, manufactures, savings, capital formation, imports and exports, etc. At the end of that decade, it was found that the targets were achieved or almost so, in some Asian countries they were surpassed - but that the division between the rich and the poor within the country was growing wider numerically and qualitatively. And so development is increasingly being conceived of as action initiated and participated in by the people to provide themselves, the poor majority, with their minimum needs - in cereals, safe drinking water, clothing, rural housing, health care, family planning, primary and adult education - for which the state must help generate adequate employment opportunities and launch and sustain a wide ranging programme of redistributive justice. Thus the new development models in Asia are more concerned with sharing the benefits of growth rather than with growth itself, with the development of human resources equally with the exploitation of physical resources, as the developed human resources are the basis of self-sustaining self-reliant endogenous development.

The new educational strategy that follows from this redefinition of development is that it no longer aims at the rather simplistic achievement of certain enrolment, pupil/teacher, unit cost etc. targets. The future educational models are being developed essentially as a contribution to the attainment of a greater degree of social equality, as part of the minimum needs programme planned and undertaken by the people to counter their poverty and social deprivation, which has in turn made for the elitist educational structures of the past and present. Educational systems are now aimed at reinforcing the drive for democratisation of society, for increased productivity, social mobility, cultural identity and national integration.

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[1] Field studies in the sociology of Indian education, NCERT, New Delhi, 1970.

Democratisation drive:

The democratisation of Asian educational systems involves a two fold move towards equalising of educational access and equalisation of educational attainments. In current models, equalisation of educational access has been attempted by increasing educational financial allocations, as noted earlier, which in an unequal society has meant increased allocations to second level and higher education that have grown at twice to thrice the rate of first level (primary) education and with little or no allocation to non-formal channels. (Unesco's office of statistics computes that between 1960 and 1975 first level education in terms of student enrolment increased at annual average rate of 5. 3 per cent, while second level increased by 9. 3 per cent and third level expanded by 9. 9 per cent). In the coming two decades, Asian educational expenditures will continue and strengthen the recent trend to concentrate on primary and non-formal education, to ensure the availability of the equivalence of primary education to all with special reference to the deprived rural areas, under schooled and unschooled children and youth and illiterate adults. In the coming two decades there will be a continuation of the current trend, some slowing down of second level and higher education to ensure that education is equally available to all, as part of the move towards a more equal society.

Such equalisation of the access to education is the first step to the democratisation of Asian education. The other more difficult part of the democratisation process is the equalisation of educational outcomes. Eighteen of the Asian countries, for instance, would have attained universal enrolment in the 6-11 age-group by or before 1985. But in terms of equalisation of educational outcomes and achievements, there are two problems that future Asian educational systems are attending to. First providing equally for all - boys and girls, rural and urban students - school places has not meant that the provision has been availed of, primarily because of the poverty of the parents and the social handicaps they face. It is estimated in 12 countries, out of 27 million children who entered class I in 1970, 13 million dropped out before reaching class IV, and overall for Asia on an average only 4 out of 10 children who enrolled in class I reached class V. The same pattern of school places for the 12-17 age-group not being availed of due to dropping out or being pushed out is reported.[1] To meet this massive problem of the growing numbers of the unschooled and underschooled, the educational systems are being restructured and expanded to include new and non-formal ways of education and training to meet the time availabilities, productive potential, and skill needs of those not availing themselves of the school places in the formal systems. This effort at providing equally to all, particularly the poor and deprived majority of the 6-11 and 12-17 age group, learning experiences and opportunities goes hand in hand with raising the income level of the low income social group, and only in so far as this new educational effort is part of the larger struggle for social and economic equality, will it be a successful move in the democratisation drive.

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[1] Development of education in Asia - Statistical trends and projections - Unesco-Paris 1978.

The second problem of equality of educational attainments and outcomes relates more directly to the nature of unequal societies in Asia, where in the same school class there are pupils who come from a minority of families with a tradition of education and scholarship running to several generation, and those who are first generation learners, whose parents are illiterates, semi-literate, and whose homes provide no environment for learning. The case for equalising educational outcomes in this intractible situation is not merely based on grounds of social equity: it also arises from the fact that in terms of productivity, industry and integrity, the latter group is outstanding when given the chance, so that the case for equalisation of educational attainments rests equally firmly on grounds of economic efficiency and social mobility on which development as presently defined by the Asian countries rests. This means that the future educational system in Asia will concentrate increasingly on the content and the inner warp and woof of the system, moving in the direction of individualised learning processes, increased peer teaching and learning, participatory organisation and management, applying classroom learning to solving practical rural and urban problems, and above all of restructuring the system itself so that only is the abstract and academic nature of the learning process brought nearer to the learning needs of the first generation learners, but the masquerade of social selection which the whole system represents - a masquerade which begins at class I and keeps on till the Ph. D. and D. Sc. level is reached - is torn aside and replaced by democratised learning and living.

III. New forms and directions

The Asian education system is developing in new comprehensive directions in the formal and non-formal areas. The major development in the formal system which brings it into the non-formal scheme is the linkages that are being established between education and work. In a sense this is a going back to the Asian educational tradition, where organised learning which was a function of peer learning and participation in work and community activities was interwoven with the socialisation process. This education work nexus now being rebuilt into Asian education as a qualitative rediscovery change affects all aspects within the educational system - structure, methods, technologies, content and its relation with all other development sectors. In all Asian countries, participation in community services such as environmental sanitation or agricultural activities are a part of the new school curriculum. In Iran, two hours a week are spent on technical courses in secondary schools, and in China middle school pupils spend one month in a school year learning industrial production and another month learning agricultural production. In the Democratic Republic of Korea, factory colleges and factory high specialised schools have been established and are part of the formal system. A rather precise definition of this worklinked learning system is provided in one part of the curriculum running from class I to class XII and right up to undergraduate and post graduate classes of one of the Asian countries in these terms: "Socially useful productive work may be described as purposive, meaningful, manual work resulting in either goods or services which are useful to the community. Purposive, productive work and services related to the needs of the student and the community will prove meaningful to the learner. Such work must not be performed mechanically, but must include planning, analysis and detailed preparation at every stage, so that it is educational in essence.

Adoption of improved tools and material, where available and the adaption of modern techniques will lead to an appreciation of the needs of a progressive society based on technology. The objectives of this part of the curriculum are to: (a) prepare students to practice and perform manual work individually and collectively, (b) acquaint students with the world of work and services to the community and develop in them a sense of respect for manual workers, (c) develop a desire to be useful members of society and contribute their best to the common good, (d) inculcate positive attitudes of team-work and socially desirable values like self-reliance, dignity of labour, tolerance, co-operation, sympathy and helpfulness (e) help in understanding the principles involved in various forms of work and (f) lead students to participate increasingly in productive work as they go from one stage of education to another and thereby enable them to earn while they learn."[1] At the higher education levels, under graduate and post graduate courses in universities and colleges, will increasingly move in the direction of the universities who have made as part of the curriculum with academic credit two to four hours a week under the lecturer's guidance, the application by each student of the theory learnt in the classroom or laboratory - physics, botany, commerce, geography, engineering, medicine etc. - to meet the specific situation which the rural poor or urban slums are facing.[2]

The other new direction in which Asian educational systems are developing is in regard to the many varied forms of the non-formal channels of learning in response to the growing problems of adult illiteracy and unschooled and under-schooled children and youth. As part of the egalitarian drive, the Asian countries are embarking on adult literacy programmes to provide minimum functional learning opportunities to the over 350 million adult illiterates (of whom one country in the region contributes two thirds of this deprived group) by the end of the current century. The programmes being undertaken combine the selectivity and functionality approach to meet people's needs and the mass nature which the mass character of illiteracy in the continent demands. This non-formal learning programme could also develop into a massive organisation of the poor to fight for their rights and obtain their rightful share in the development of the country, in land, in housing, in employment, in wages, in wealth etc. The second growing non-formal education programme relates to out-of-school children and youth who are the second largest educationally deprived group. Here a number of innovative programmes is starting to meet the precise learning and training needs of the young people. Other such programmes relate to education of the tribals and nomads, education and training of girls and women, and the many efforts at deschooling and retraining. Certain general features of the non-formal education programmes as they develop and play an increasingly important part in the coming two decades are that; it is not being conceived as an alternative to formal education but as part of a total learning system; this means that the links between the two - their feeding in and

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1. Government of India: Report of National Review Committee on Higher Secondary Education, New Delhi, 1978.
2. Malcolm S. Adiseshiah: The University in 1975, 1976, 1977, Madras University, Madras, India.

feeding back of education and the importance of adequately financing the non-formal education subsystem - are becoming a major obligation of public and private agencies; and finally the programmes themselves are community based and rest on local participation, which plan and operate them, using methods and techniques to tailor the educational and training services to meet local specific needs of the people and the ecological environment.

Other developments of importance for the future include the integration of the methods and materials of pre-school education in the early classes of primary schools with its implications for the training of primary school teachers (for the coming two decades pre-school education as such is not likely to receive a high priority because of resource constraints) and the system of multiple entry and exit as between the formal education system, the non-formal system, the market and the world of work. Five of the Asian countries have introduced this important reform. Also a beginning has been made in the various open learning paths in the Asian learning system through radio, correspondence courses, distance learning techniques and open university systems - all of which will play a growingly important part in the widening access that the systems will offer in the coming two decades.

Education - employment:

At present education and unemployment have become almost synonymous in Asia. Unemployment is lowest at the primary school completers level (at around 5-6 per cent), highest at the second level completer's level (at around 40-50 per cent) lower but high (at around 20-30 per cent) at the higher education completers level. The basic causative factor is that the educational outputs do not meet the skill needs and demands of society. Everywhere in Asia agricultural production and productivity are both fluctuating and low, needing the extension services which can carry the research results to the farms, needing the technicians who can maintain, repair and rent out farm implements, needing animal husbandry, fisheries and small industries promoters and agents that can help the marginal farmer and landless agricultural labourer supplement his monthly income. Similarly there is everywhere the unmet demand for the rural nutritionist, the village community health worker, the community health assistant and so on. While these employment demands remain unmet, the educational system is training men and women for the small urban industrial sector for wage employment which can accommodate only 25 per cent of the 15 years age cohort (in India it is even less at 10 per cent). Looking at the Asian education employment canvas, it seems clear that the mismatch between the educational output and employment demands, between educational supply and demand is not a quantitative problem but a qualitative one. It is not that education systems are over expanded, (they are not in relation to the over 50 per cent being outside of the schools and the 60 per cent adult illiteracy), they are turning out the wrong kind of skills. The result is that in Asia educated unemployment takes on an inverted 'U' curve pattern, as noted earlier. That is, the wrong kind of skills are turned out at the second and third levels, for jobs requiring second level qualification third level diplomas are demanded, resulting in a larger unemployment bulge at the second level, and in deflation of higher education diplomas and degrees. In most Asian countries, educated employment has reached catastrophic proportions. In the Philippines 29 per cent of high schoolers and 1/3 of college graduates are reported to be without jobs. In Sri Lanka, 72 per cent of the unemployed are with middle school education, as is the case in India where the number of educated job seekers registered in the Employment Exchanges exceed 10.6 million (as noted earlier). And educated unemployment is inexorably increasing. According to a survey of educated unemployment in Thailand, the unemployment rate among higher education graduates was 25.3 per cent in 1973, 44 per cent in 1974 and 45.5 per cent in 1975.[1.]

What of the education-employment futures in Asia? Here a starting point is the ILO World employment programme projection that even if additional non-manual modern sector jobs are created at an annual 5 per cent rate "one half or more of all secondary school graduates in 1980 would not be able to get such jobs. The 'accommodation rate' (that is, the percentage of secondary school graduates absorbable in non-manual jobs estimated in this connection for 7 countries in the region would be 26 per cent for India, 27 per cent for Republic of Korea, 54.5 per cent for Malaysia, 22 per cent for the Philippines, 53 per cent for Singapore, 17 per cent for Sri Lanka and 53 per cent for Thailand".[2.] This rather grim estimate is if anything optimistic, as in the case of one of the countries mentioned, India, that country's planning commission on the basis of a more detailed and precise computation places the country's accommodation rate at 11 per cent (rather than the ILO's 26 per cent).[3.] As for the future in this area, Asian governments are tackling the problem on both the demand and supply sides. On the demand side, an expansion of the organised "modern" sector is being pushed forward to increase its employment absorption capacity, rural infrastructures and social services under each country's minimum needs programme are being developed under which jobs are generated for technicians, community health workers, adult educators, and other agricultural workers, animal husbandry, forestry, fishery and rural development programmes are being planned and executed resulting in additional employment opportunities. The demand side, which is the Asian economy, must and will do its share in this education - employment area.

Given the time lag in the changes proposed on the demand side and the fact that at least 50-70 per cent of the annual addition to the labour force and about that percentage of educational products will not be employed in the organised sector, it is the supply side - the education system - which will have to resolve the problems posed by the education employment nexus. First education has to train the majority of its pupils in the formal and non-formal channels to work in the unorganised sector. This means first that the major level priority is primary education and adult literacy and

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1. Thailand: National Social and Economic Development Board. Survey of Educated Unemployment, Bangkok, 1975.
2. World Employment Programme Research Paper: The basic arithmetic of youth unemployment, ILO, Geneva, 1976.
3. Draft Five Year Plan 1978-83, p. 82, Government of India, New Delhi, 1978.

education. Second it means that at all levels curricular offerings and the content of learning will have to centre around the countrys' rural occupational skills and even in regard to scientific research, engineering, technology and medical education the focus will have to be what is called the unorganised sector. Asian countries are moving in these two directions more rapidly with regard to the priority for first level and adult education, a little more cautiously and slowly (because of the dead weight of the existing system) in regard to curricular and content changes and in engineering and medical educational orientations. There is the further more painful future task of cutting back on higher education full time enrolments so that the numbers of general arts and science graduates are reduced in the coming two decades, alongside of opening up non-formal higher education streams through evening and correspondence courses, offering a variety of job oriented curricula, with greater flexibility with regard to completion time, age of admission and multiple entry. Of the same order is the need to overhaul industrial and vocational training programmes so that their curricula reflect the fact that they are training for the general labour market, leaving to the individual firm to train persons for specific jobs. The criteria for the design of these general vocational training systems and the test of their success are those of the labour market and the education system. The other area which needs restructuration is secondary education where the future points to the increasing diversification of this level of education, in both its formal and non-formal channels, with its vocational streams being terminal for the majority of completers. One important corollary of this future programme is to make formal education (not learning) terminal for a majority of secondary school completers and to reduce the general arts and science intake into colleges and universities is to provide subsidised second level and higher education only to students from low income families. All others should pay their way - which in turn meshes with the priority to primary and adult education and the reduced allocation to other levels.

There is one more element in this education employment complex and that is the proposal which many Asian countries have under consideration to delink educational degrees and diplomas from job qualifications. The futures in this area point to such essential delinking which is necessary and good both for education which is being deflated and distorted by the employers not doing their work, expecting education to do it for them, and also for the enterprise as it will then use real employment tests and not the present phony filters. One of the largest countries in this region is planning to set up a Public Sector Qualification Commission for rationalising the whole structure of essential and desirable qualifications first for governmental and public enterprises posts and similar boards to develop recruitment policies and procedures for private sector entreprises. The Commission would be required to reduce the number of job tiers, lay down detailed task oriented description for each job category, and delink the required qualifications completely from the general arts and science degrees.

IV. Education costs and finance

The problem that Asian countries face in regard to educational cost and finance is the constrast between mounting educational costs and the near ceiling on educational financial resources and efficiency of the use of the finances allocated to education. Educational systems are labour intensive and the future Asian education system will continue to employ - as teachers and students - an important part of the total educated manpower of the country. Within the system there is considerable financial and human waste in the lavish but underutilised way in which human resources are used, in the numbers of years invested by the system to produce a school or university completer (which is 300 per cent over what is required), in the low unit cost at the first level and the very high one at the higher education level (unit costs as percentages of GNP per capita is for Asia 11 at primary, 27 at secondary and 205 at higher education), in the essentially unadapted borrowed model of the formal educational system and in its unutilised capacity (school and universities used for 5 hours a day in 5 or 6 days a week, and teachers and equipment available for less than that time). Studies[1] that have been undertaken show that at least 20 per cent of the annual educational budget are wasted, and for the future before any additional funds are requested, there should be redeployment of these large funds and fuller use of existing capacity. In addition, the mobilisation of new and unconventional resources (at the heart of which are the under-utilised human resources represented by the people, their skills, their motivation and their practical wisdom which should be the foundation for the future educational strategy), the introduction of some cost saving educational technologies (mainly in regard to designing school building and teaching and learning materials), the shifting of some of the costs (for industrial training) to the private sector enterprises, and the greater use of educational loans rather than educational grants and subsidies should be the future line of development for this region in the matter of financing and costing.

Management:

Educational management in Asia is still at the handicraft stage. Its underdeveloped nature is seen in the growing gap between educational plans and educational achievements (the performance gap), the similar gulf between policy pronouncements and actual implementation (the communication gap), the gap between the new tasks facing the country and the ad hoc crisis-like response to them (the response gap), the contrast between aims and objectives and the rules and procedures established to attain them (the attainment gap), and the contradiction between the professed democratisation of education and elitist character of its management (the integrity gap). The heritage in educational management and administration is a poor one in Asia. It has been and is a system which opts for stability when change is called for, for replication when innovation is demanded. The task for the future is to transform the status quo maintenance administration into a system of management for development. Such development management will have to break out of the departmental mould in which it has been cast, and learn to move across the bureaucratic boundaries and reach across to the development departments of agriculture, health, labour and social welfare which are engaged in major non-formal and formal educational activities, and to move out of the classical educational sub-divisions of primary, secondary, higher and teacher training, to manage programmes of integrated rural development, non-formal education, open learning systems, community education etc. In fact the educational manager in Asia is sitting on a volcano: the simple verities of: education being equal to schooling in its turn being equal to teaching is fast disappearing, because the student body is no longer the home genous middle class group, as disturbing new abilities, new aptitudes and new motivations from the first and second generation learners are creeping in, because teaching does not result in learning but on the contrary in the running away of pupils from schools, and because examinations do not prepare for life but for unemployment. These are but part of the new educational landscapes of the future to which the education manager trained in multidisciplinary thought, interdisciplinary pursuits and sustained by a continuing intensive input of research and development must be sensitive, receptive and ready for the systems reform, restructuration and management to which Asian education beckons.

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[1] First Report of the Educational Finance Commission: Government of Tamilradu, Madras 1976.

BASIC EDUCATION FOR MEETING BASIC HUMAN NEEDS OF THE RURAL POOR

by Philip H. Coombs

Recent writings on the 'basic needs approach', which have proliferated rapidly, have paid surprisingly little attention to education. To be sure, they regularly inscribe education (generally meaning primary schooling) on the standard list of basic needs of the world's poor, but there the matter ends. Rarely is there any recognition of the urgent learning needs of out-of-school youth and adults, or of the fact that appropriate learning components are needed within virtually every kind of programme for meeting the various basic needs of poorer people in developing countries.

Equally surprising, the prolific recent writings on 'basic education' have, in reverse, largely ignored basic human needs, except to regard education as clearly one of the most important. Here again, however, 'basic education' is frequently confused with primary schooling and the important learning needs of out-of-school youths and adults are ignored.

It is high time, I suggest, to bring these twin concepts of basic needs and basic education together, for either without the other makes little sense. It is also time to clarify the differences between primary schooling and the kinds of 'basic education' required (in conjunction with other factors) to help poverty-stricken people of all ages to meet their basic needs.

This paper attempts to shed some light on these matters. It focuses mainly on the rural poor in the developing world because they comprise the great majority of all the poor and because it was the growing concern over their plight that gave birth to the basic needs approach. Much that is said here, however, also applies to the urban poor, for they are largely an extension of the rural poverty situation.

My remarks, I should also explain, will be strongly influenced by the evidence, impressions, and general observations about rural people and rural development that my ICED colleagues and I have accumulated over the past several years doing on-the-spot analytical case studies of a wide assortment of rural projects and programmes. These programmes are located in over two dozen countries spread across all of the major developing regions. They range in subject from agriculture and rural industry to health, family planning, and special acitivites for women and out-of-school youth.

Against this background I shall view rural development and the needs of the rural poor from the grassroots level looking up rather than from the national or international level looking down. Things look very different from this local vantage point than from on high, and the difference shakes whatever faith one may once have had in tidy national plans, finely-honed project designs and those bewitching quantitative models that forecast the future. One soon discovers, for example, that some of the rural projects that looked so good on paper and were considered 'success cases' back at headquarters are in fact having little or no beneficial impact on the lives of local people, especially the poorest. Occasionally, however, one also runs into a project or programme that is yielding useful results, but not of the kind intended. I offer this explanation at the outset because some of my later statements may seem at odds with the conventional wisdom expressed in international policy papers and seminars.

Characteristics of the rural poor

At the risk of repeating the obvious it may be useful to begin with a few pertinent facts about the rural poor. It has been estimated that out of more than 1,800 million people in the developing world in 1972 about 1,200 million - or two out of every three - could be classified as 'seriously poor', and of these roughly 700 million - or one out of every three in the total population - were downright 'destitute'. They are living (if it can be called living) in what Robert McNamara dubbed absolute poverty, eking out a bare subsistence from day-to-day under sub-human conditions on the ragged edge of sheer survival. Their absolute number is said to have doubled between 1960 and 1972.

These destitute people are heavily concentrated in South and Southeast Asia but other developing regions have their share. There are considerable variations, of course, among individual countries. The great bulk, as earlier noted, live in rural areas, either with no land of their own at all or with too little to feed themselves. It is their children who are concealed behind those shockingly high statistics of non-schoolgoers and early drop-outs found in so many areas. On the average school day one finds them out scavenging for spilled grain or scraps to help keep the family alive, or cleaning a more affluent neighbour's house to earn a meagre dish of rice for lunch, or at home tending younger siblings while the mother works. Disease and malnutrition are written all over their little bodies. For them four years of primary schooling, and for their parents the idea of becoming literate, is an irrelevant and impossible dream.

These families are the most vulnerable to natural or manmade disasters. When the radio reported recently that thousands of people had been swept away by a monsoon flood in India, other thousands buried alive by an earthquake in Iran, and several hundred civilian by-standers shot up in a political revolt in Nicaragua, one could be also certain that the bulk of these tragic victims were from the destitute group. It is important to note that within this group the women and young children are the most vulnerable; they carry a disproportionate share of the burdens and penalties of poverty.

No elaborate social science survey and computer run are required to ascertain the 'basic needs' of these people. They are, in the first instance, the most rudimentary essentials for physical survival: enough nutritious food and safe water to keep alive; protection against crippling and killer diseases; minimal maternal and child care; family planning services; shelter agains the harsh elements; and central to all of these, an opportunity to earn a minimal family income. As will be shown later, appropriate education is an essential requirement for meeting each of these survival needs. Despite conventional doctrine, however, literacy is not the first among these educational needs (though it may become important later after the initial survival needs have been met).

There are many popular myths about villages and villagers, even among educated people who operate rural services. One of the most common is that they are essentially all alike; thus what is appropriate for one village or rural family is appropriate for all. Another myth is that illiterate rural people who have not been to school are ignorant and don't know their own best interests; hence they must be treated like children and told what is good for them. A third myth is that poor rural people are inherently lazy, if they had any spunk or drive they would not be poor. History testifies that rural programmes built on these false premises are bound to falter, as a great many have.

Virtues and limitations of the basic needs approach

The basic needs approach is offered as a solution, or a least partial solution, to the conditions of extreme poverty described above. How valid and workable a solution is it? In commenting on this question I hope not to become embroiled in the confusing and increasingly esoteric debate over what the basic needs approach really is or ought to be and whether it is sound or unsound, humanistically motivated or a capitalistic plot, or just another fashionable piece of international rhetoric that no one really intends to implement.

To me the prime virtue of this basic needs idea is that it starts where any good development strategy ought to start - with the condition, needs, and aspirations of the people themselves, not with an abstract and dehumanized quantitative model. Further, it abandons the old trickle-down theory that never really worked and calls instead for a direct and pointed attack on the roots of poverty. It also stirs up fresh thinking in all sorts of places and challenges those who disagree to come up with a better idea.

The basic needs approach as presented to date, however, is like a compass that points in the right direction but offers no roadmap on how to get there. This is the heart of the problem. Anyone attempting to draw such a roadmap will do well, I suggest, to consider the following point.

First, the basic needs approach is clearly not a total development strategy in itself (nor was it ever intended to be by its initial architects). The overall strategy of which it is but one part must provide not only for more equitable distribution (implicit in the basic needs approach) but also for steady and substantial economic growth. Redistribution alone, even if it were politically and administratively feasible, could only result in a broader sharing of misery. There must be more produced to distribute.

Second, and I make this point because some educators are apparently hesitant on this score, I fail to see as a one time student of economics any inherent conflict between a concerted effort by developing countries to alleviate domestic poverty through a basic needs approach, and parallel efforts to improve their trading position through some sort of 'new international economic order'. Logically the two efforts should be entirely complementary and mutually reinforcing. Improved trade arrangements could fuel the economic growth essential to making a real dent on widespread poverty. But accelerated economic growth without a simultaneous attack on domestic poverty and inequality would simply perpetuate and enlarge the existing lopsided pattern of income distribution. The issue, it seems, finally comes down to whose ox is being gored and whose nest is being feathered.

Third, the basic needs approach can never be successful as a cut-and-dried formula, which is the risk it runs in the hands of international econometricians. It must be flexibly adapted not only to differences among countriesbut to differences among areas within countries and, most important, among various subgroups within the same rural community. The record is replete with instances in which the agricultural production and income of a particular rural area increased dramatically, yet the poorest members ended up no better off than before - or even worse off, as when many subsistence farm families in Asia became landless during the Green Revolution. International and national planners remote from all these local diversities are prone to fix global norms, targets, and time schedules, to envisage neat and uniform administrative structures.(running always from the top-down) and to create standardized packages, messages, and instructional materials intended to fit all people in all situations. But if the experience with rural development over the past 20 years teaches anything, it is that this excessive passion for quantification, standardization and a top-down approach is self-deceiving and counter-productive.

My final observation is that this laudable goal of helping the world's poor to escape from the throes of absolute poverty is by far the most complex and difficult international development goal yet to be tackled. The plain truth, seen from the grass roots level, is that nobody yet really knows very much about how to implement it (though there are many useful ideas emerging). The best and probably only way to learn how to do it is to examine critically the practical experiences of selected rural programmes that have useful lessons to teach, both positive and negative (the latter often being the most important). But major funding and operational agencies have seriously neglected this opportunity to learn important lessons of experience, always being so preoccupied with the next crop of projects to have time to learn useful lessons from the old ones. This, incidentally, has been the basic purpose of the ICED case studies mentioned earlier, but a far wider effort along these lines is needed.

The main point here, however, is that making sizeable gains toward the goal of uplifting the rural poor will inevitably require tremendous and persistent effort by many parties over many years. It will also involve many uncomfortable changes from top to bottom in existing perceptions, attitudes, structures, and behavior. Therefore it is extremely important not to underestimate these complexities and the obstacles and resistances bound to be encountered, and not to set unrealistic targets for the Year 2000 or any other year that will raise false hopes and inevitably ed in disillusionment. There has been enough experience with such unrealistic targets before, including educational targets, to justify repeating the same mistakes.

Where education fits in to meeting basic human needs

Let us move directly now to the central topic of this paper: how and where education fits into the basic needs approach.

To talk sense about education - especially 'basic education' - in this context, the first essential is to liberate one's mind from all the conventional forms and rituals of formal schooling that becloud one's vision. In place of a narrow institutional view of education which, for example, equates 'basic educaton' with four years or more of primary schooling, one must start with a much broader functional view that equates education with a wide diversity of learnings that rural people require, all during their life, to meet their basic needs and to get ahead. Certain of these essential kinds of learning, to be sure, can be acquired in school or in various types of non-formal school-equivalency programmes, but for the most part they must be acquired in other ways. Seen in this broader perspective, education is a dynamic, cumulative life-long process applying to all people regardless of age, sex, or station in life.

To say this is not to denigrate the importance of formal primary schooling. It is simply to recognize that these schools by their very nature are best suited to providing only certain types of learning for young people, especially the '3-Rs', but they are clearly not designed to serve the full spectrum of essential learning needs either of children or of teenagers and adults. Schools are not all-purpose weapons and were never meant to be. They should be encouraged and helped to do better what they are capable of doing. But they should not be overloaded with additional inappropriate tasks or else they will end up doing nothing well.

Two further hard realities must be reckoned with in considering rural primary schooling in the poorest developing countries. One concerns its availability, the other its 'fitness'. Almost without exception these poorer countries have been making valiant efforts and sacrifices over the past 20 years to expand access to schooling with the goal of achieving universal primary education by the early or mid-1980s. Yet today the great majority of their rural school-age children and youth are still not in school and Unesco predicts an increase in the number of out-of-schoolers by 1985. Despite the much rosier impression conveyed by published national statistics of enrolments and participation rates, it is not unusual today to find only 10 per cent of the children in a rural area (fewer of the girls) completing the primary cycle, and only one or two out of ten of these completers continuing on to secondary school. Considering the present severe strain on the national budgets of low income countries, the high percentage of the total budget already going to education,. the modes economic growth rates of these countries, and the race their primary schools are having against high birth rates simply to keep present pupil participation rates from falling, not to mention other equally incorrigible factors that are keeping the poorest rural youngsters out of school, it is plainly unrealistic to suppose that universal schooling in their rural areas can be even within shooting distance by the end of this century.

Even if it could be, however, what then? Most observers agree that these urban-oriented rural primary schools are ill-suited to the realistic life prospects and needs of most rural children. They benefit primarily a small minority lucky enough to escape their village and climb further up the academic ladder with a fair chance of landing a modern type job in the city. Meanwhile their peers who stay behind are left with a frustrating sense of failure.

This is not to suggest that there is no room or hope for improving and reforming rural primary education to make it more functionally relevant to rural life. But it must be kept in mind that the children of the most destitute rural families are always last in the queue to get into school, and generally the first to drop out. Hence a future strategy of expanding and improving rural primary schools in the name of improving the chances of the poorest of the poor could prove to be nothing more than another go at the old trickle-down approach.

The pertinent question here, however, is not whether and how soon four years or more of primary schooling can become a reality for the poorest rural children, but whether this can be realistically considered an adequate 'basic education' to meet their basic needs. Quite clearly it cannot. A few years of primary schooling that is well adapted to the local needs and circumstances can certainly help but it is certainly far from sufficient, as will be seen when one examines the ubiquitous rôle of learning in the process of rural development.

By its very nature rural development requires extensive changes in the attitudes and behaviour of the rural people themselves - changes in their methods of farming and other work, in their dietary and health practices, in family and community relationships, and in a host of other respects. The fundamental rôle of education - viewed broadly as learning - is to provide rural people with new insights into their own life and circumstances and with a wide range of new knowledge and skills that will encourage and enable them to accept and adopt various changes when they can see for themselves that it is in their own interest to do so. Contrary to the tacit assumption of many extension programmes, rural people do not abandon their customary practices in favor of new ones simply because some visiting expert or 'message' from the center tells them it would be good for them. They have been burned too often with bad advice and confused by conflicting advice.

Any programme that has the goal of helping rural families to improve their condition - whether its focus is on agriculture, rural industry, health care, family planning, raising the status of women or some combination of these - is an educational programme. Different kinds of knowledge, skills, and information must be disseminated to various groups in such programmes, including both the participant-beneficiaries themselves and the various categories of workers involved in operating the programme. Technical skills and knowledge is not all they need. They must also learn to build and participate in local institutions that carry out the development activities. Most basic of all, the poorest families who have been sitting fatalistically on the sidelines looking in from the outside, must acquire a new awareness of the roots of their problems, the possibilities for change, and what they can do themselves to help bring about such change. In short, an educational approach needs to permeate all the activities of a rural development effort because an effective development programme is in itself an educational experience in the truest and broadest sense.

Consider as just one example the wide variety of things the members of a poor rural family must learn and the many new practices they must adopt in order to protect and improve their health. The typical list might include: a variety of new sanitary practices; new methods of maternal and infant care; preventive measures against common diseases; new methods of food preservation and preparation; changes in the customary family diet (particularly for pregnant or lactating mothers and infants and young children); growing new types of nutritious foods to improve the family diet; adoption of family planning to regulate the spacing of new births and the size of the family. A similar list could be made with respect to other basic needs of poor rural families.

No single institution, fixed curriculum or standard set of pedagogical methods could possibly serve all of these different learning needs and clienteles, ranging from young children to elderly adults and shifting constantly as local development gains momentum. An examination of the variety of educational activities in a broad sample of rural situations reveals the wide range of alternative educactional approaches available and their respective strengths and limitations.

Various ways of providing a rural basic education

There is no space here to go into the great variety of possible ways to provide or acquire the diversified basic education that rural people require to meet their basic human needs, but a few general observations may be helpful.

First, these kinds of knowledge are generally best learned when the learning is directly tied to immediate life concerns and to actions that use the knowledge. Knowledge presented in abstract form in a classroom-like setting detached from real life is least likely to sink in, especially for learners who are unaccustomed to classroom learning and to dealing in intellectual abstractions. The discussion method centering on live problems in their home or community which the participants themselves identify and explore is almost invariably more effective than the lecture method where a teacher or instructor 'tells them'. Such discussions and other local learning processes, of course, must be fertilized and enriched with new kinds of knowledge coming into the community from the outside. This is where various visitors from the outside such as extension agents and relatives returning from the city, and various communications media such as posters, films, boradcasts, bulletins, and simple newspapers can plah an important rôle, provided they are well programmed and tailored to the interests, needs and learning styles of the particular audience. Broadcasts from the city by a learned expert on nutrition, or new rice varieties or family planning generally go right past the villagers without leaving a trace. But well conceived broadcasts can have a sizeable impact and enrich the local 'learning environment'.

A second point, often overlooked, concerns the differentiation of audiences within the same community. For some purposes an educational effort may appropriately be directed at the whole community, such as a programme aimed at acquainting the rural people in one part of the country with the folk tales, music and arts of another part. But for many purposes the effort must be tailored to the special circumstances, needs and interests of a smaller, more homogenous subgroup -such as out-of-school boys or girls from poorer homes, marginal farmers, destitute widows, young married coupled, or indigent leather workers or similar special occupational groups in distress. An agricultural extension programme geared to the technical and economic capabilities of larger commercial farmers in the area will not fit the needs and feasibilities of small subsistence farmers; they need a quite different approach.

Third, much of this learning does not have to be (and indeed cannot be) provided by professonal instructors or discreet educational courses or programmes. Much of it is done - and often best done - in conjuction with their other activities by various workers in a programme who may not even think of themselves as teachers. The local health worker and midwife, for example can perform very important and continuous educational functions during their household rounds and their consultations in the local clinic. They too, of course, require special training in order to perform their duties effectively, and there are also many alternative ways for these 'programme operators' to acquire the knowledge and skills and attitudes they need to do a good job. Incidentally, two-week intensive training courses at some urban center far from the scene of their future work, is one of the most popular methods but often the least effective. Villages also have their own built-in 'teachers' who can spread skills and knowledge -the more progressive farmers (often not the largest ones), the blacksmith, carpenter, stonemason and tailor, and the old man who can recite local history.

All these educational resources, however, are best used when they are mobilized within the framework of a locally organized and dynamic community-wide development effort.

Fourth, ICED's observations in various developing countries indicate that programmes bearing the label 'adult education' are frequently not addressed to the kinds of basic learning needs of poor rural adults discussed above, though there are numerous exceptions, particularly involving voluntary organizations. The bulk of adult education programmes, especially those sponsored by ministries of education, turn out to be mainly literacy classes whose appeal to the poorest rural adults is low and whose record of success even with less poor adults is generally disappointing. The basic learning needs of rural adults are actually more extensively served by programmes and activities that bear no 'education' label but, nevertheless, contain significant educational components.

From this brief description of the diverse rôles that education must play in rural development it should be clear that education is not a separate 'sector' but rather an essential common ingredient that nourishes and invigorates every sort of development activity in all sectors. There is no surer way to divorce education from the mainstream of development and to subject it to charges of irrelevancy and ineffectiveness than to treat it as a separate sector unto itself, owned and operated by 'education specialists'. In the process of rural development everyone sooner or later becomes both a teacher and a learner.

Some organizational and planning implications

The kind of local rural development process we have envisaged here clearly cannot be planned in detail in the capital or administered simply from the top down. Nor can the great variety of educational activities described above be made to conform to any preconceived overall educational plan. They have to be largely pragmatic responses to various perceived needs and opportunities that surface as the development process unfolds. Although the ways and approaches to implanting the educational ingredients in the development programme have to be considered at the stage of conceptualizing and planning the programme, no educational master plan constructed before the event can possibly anticipate all the learning needs and opportunities that may eventually arise.

General nationwide planning at the national level will remain essential in order to assess broad requirements and the feasibilities of various alternative strategies and to set general priorities and budgetary allocations. Similarly, appropriate central management services and guidance will be needed. But in contrast to the prevailing situation in most developing countries where most of the reins are tightly held at the top, there must be a progressively greater decentralization of planning, management, and true decision-making functions to lower echelons and reaching right into the local communities themselves.

The practical choice is not between a purely top-down or purely bottom-up system for neither by itself could work effectively. What is called for is a new syntheses between the two in which much more initiative is taken by the community and in which the central government agencies change their conventional directive rôle into a facilitating rôle. When this happy state is reached (and it will obviously take much longer in some situations than others) the chief functions of government agencies and agents will not be to tell the local people what they must do and how they must do it in accordance with preconceived plans, directives and messages from on high; rather their main rôles will be: (1) to stimultate local development institutions and initiatives; (2) to provide realistic advice, guidance and technical assistance as needed, including information about appropriate new technologies, training and backstopping of local development workers, and provision of essential health supplies and agricultural inputs; (3) to respond promptly to reasonable requests to break specific local bottlenecks beyond the community's own capacity; (4) to help communities to evaluate and improve their own development efforts; and (5) cutting across all of these, to provide a continuous supply of new knowledge and skills that will develop and enrich each community's human resources and capacity for self-help.

A further important function will be to prod the local elite and power structure where necessary into including the poorest members of the community in all development activities and benefits, even to the point at times of discriminating in their favor. For in a great many rural communities the local elites may be far less committed to helping their poorer brethren than the political leadership at the national level. And in those countries, of course, where the national leadership itself is not seriously committed to improving the lot of the poorest sectors of the population, widespread basic education and the basic needs approach will in all probability have to await a better day.

Finally, when considering the diverse educational elements required to support a basic needs approach it is useful to envisage the gradual building up of a flexible network of educational options and opportunities for all members of rural communities. Such a network must inevitably include a combination and great variety of informal, formal and non-formal educational provisions and various hybrids of these different modes. Some learning provisions will stand separately as distinct educational activities while many others will be integral elements of various development programmes.

The basic function of educational planners in this context will be to guide and encourage the evolution of such a network, giving it as much coherence and relevance to evolving learning needs as possible yet, without trying to prescribe and manage it in detail. This will be a much more operationally oriented kind of planning than prevails today and will require educational planners to work in close partnership with programme operators and planners in other areas.

Primarily and secondary schools, reinforced by higher educational institutions, can and must play a key rôle in this diversified rural learning network. But to do so they must become less urban and more rural oriented and they must aim to prepare their pupils for more effective rural lives and not simply for getting into secondary school and migrating to the city (and it should be possible to provide both types of preparation simultaneously in order to serve all young people equitably). They must also adapt their schedules, curriculum and teaching methods to the practical life necessities of their clients. For higher education to provide strong support not only for the rural learning network, but for the overall basic needs approach and overall social and economic change in rural areas, there is strong need to create broad-gauged 'rural development colleges and universities' which, unlike most present higher institutions, will concentrate their research activities on solving rural problems and needs of all kinds (not just agriculture) and their instructional activities on developing the human resources needed for authentic rural development. Institutions with faculties seriously dedicated to these purposes could be highly innovative and extremely stimulating places to work and study.

Summary and conclusions

This paper has attempted to clarify and knit together the concepts of 'basic education' and the "basic needs approach' by viewing them in the broader context of overall rural development and from the perspective of the village level rather than the national or international level. The general picture sketched has necessarily been impressionistic, but several important conclusions emerge.

(1) The basic needs of the rural poor cannot be met in isolation. They can only be met through a broad process of social, ecnomic and political change affecting the entire population of a rural area and linking it more closely to urban areas and to the overall national development process. However, rural development can occur without the poorest families being included, as has already happened in some areas. For the poor to participate equitably, as both contributors and beneficiaries, will generally require special efforts in their behalf within the framework of the broader process.

(2) Rural development in the fullest sense must be achieved primarily through the initiatives of the rural people themselves, acting both individually and collectively through their own local institutions, beginning with the family. Government and other outside agencies nevertheless have vital rôles to play, particularly in stimulating, supporting and backstopping local initiatives; in providing prompt help when needed to break local bottlenecks; and in seeing to it that the most disasdvantaged and politically voiceless people get fair treatment in their community.

(3) To bring about a more effective partnership for rural development between national governments and rural communities will require far-reaching and difficult changes in existing bureaucratic structures and styles as well as the strengthening of rural communities, organizationally and politically, so that they can help themselves and obtain and use more effectively appropriate help from the outside. What is required in essence is the replacement of the present fragmented, top-down approach by a battery of official development agencies at the center with a new synthesis between a top-down and bottom-up approach in which government agencies assume a facilitating rather than a directive stance and local communities are given a major voice in their own future and challenged to exert themselves to win a better future.

(4) Viewed in this broad perspective the educational requirements for successfully meeting the basic needs of the rural poor (interpreting education broadly as learning and not simply schooling) are extremely diverse in character and enormous in the aggregate; If rural areas are to change and develop then the rural people themselves must change and develop in a great variety of ways. For this they must first see themselves and their surroundings in a fresh light and appreciate their own inherent power to improve their circumstances. In additions they must constantly learn new things - things that cut across all the conventional 'sectors' such as agriculture, rural industry, health and family planning and that will encourage them to alter their perceptions, aspirations and behaviour in numerous ways. Looked at in this light education is clearly not one more separate 'sector', but rather a vital lubricant and source of nourishment for all types of development efforts in all sectors.

(5) Viewed in this perspective it is also clear that a primary school education, even if all rural children including the poorest could secure one in the foreseeable future (which is highly doubtful), cannot realistically be equated with the kind of 'basic education' required to meet the basic life needs of rural people. It can contribute significantly (provided the present conventional model

is appropriately reformed and reoriented), specially by equipping children with rudimentary knowledge and intellectual skills that can help them later to acquire other essential skills and knowledge. But to lose sight of the equally large and urgent learning of needs of the masses of out-of-school rural youth and of the adults who also have important learning needs would result in a very lopsided and counterproductive educational strategy.

(6) What is needed in the long run and what should be started now is a flexible network of highly diverse learning provisions that can serve the whole rural population - children, youth and adults alike - and provide each individual, family and special group with pertinent options to satisfy their ever evolving learning needs, interests and circumstances. Formal education at all levels has strategic rôles to play in this network, but it is no substitute for the network. Most of what rural (or any other) people will need or want to learn must be learned outside the structure of the formal system - through organized discreet non-formal education programms of many sorts, through non-formal learning components incorporated within various development programmes, and, most important of all, informally through their daily experiences and the educative influences all about them.

(7) The kinds of educational activities and the kind of community-based rural development envisaged here cannot be prescribed in detailed master plans conceived in advance, though they will benefit much form a clear framework of forceful policies and strategies. They must evolve pragmatically in response to opportunities and needs as they arise and in adjustment to changing circumstances. Planners in this type of context will deal far less with their quantitative models and projections and far more with operator/implementers of every variety. Their task will not be simply to plan targets, but to plan and facilitate their practical implementation.

(8) Finally, we should have no illusions about the many years it will take to get from here to there and the innumerable obstacles and difficulties that will have to be overcome along the way. For this noble and humanistic goal of helping the world's rural poor to pull themselves up by the bootstraps is by all odds the most complex and difficult - and indeed the most heroic - international and national development goal ever articulated. The sooner we all climb down from the heights and tackle the practical problems of implementing it, the sooner significant progress can be made toward achieving this goal.

THE ECONOMIC CONSEQUENCES OF THE LONG-TERM PROSPECTS FOR THE DEVELOPMENT OF EDUCATION IN DEVELOPING COUNTRIES

by François Orivel

I. The problems raised by the past and future trends in the allocation of public resources to education

When the trend for public expenditure on education is compared with that for the GNP in a given country, one almost always finds that there is a close correlation between the two, with the correlation coefficient generally between 0.95 and 0.99. This observation is obviously true both for the global figures and the per capita figures. This does not however permit one to draw any conclusions with regard to the possible causal relationships between these two variables: is it the educational expenditures which, in the manner of a productive investment, promote economic growth or, on the contrary, is it this economic growth which, as a result of the overall increase in the wealth of the nation as a whole, enables more resources to be allocated to intellectual needs, since those of physical survival have been more or less satisfied?[1]. The answer is certainly not so starkly Manichaean. It is unlikely that economic growth will not be influenced by the type and level of training given to the labour force. Many developing countries have had to cope with shortages of certain types of skilled manpower which they have been able to overcome only by importing labour from the developed countries, often at exorbitant cost. But it is also very likely that an important part of expenditure on education is a consumption expenditure with no significant effect on economic growth. In this case, it is in fact the increase in income which makes possible an increase in the consumption of education. It is therefore clear that complex inter-relationships exist between expenditures on education and national income and that these vary in time and space, in relation to the situation, the level of development, the historical context, the system of values etc.

The close correlation between chronological data on education and GNP is mainly the result of the expansion of the system as a whole. One would observe similar degrees of correlation between expenditure on education and expenditure on housing or between expenditure on education and the output of steel, whereas there is obviously no necessary relationship between these variables - they all increase as the result of the growth of economy and changes in structure are less marked than changes in the absolute values, which explains why structural changes tend to be masked by these correlation coefficients. The same phenomenon occurs with transverse data, where the differences in the absolute values for per capita GNP or per capita expenditures on education are much more marked than differences in structure.

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[1] This observation of course applies only in the case of developed countries.

When one analyses the structural variations, measured for example by the percentage of GNP allocated to education, the statistical relationships are much less clear-cut. In a recent study[1] we showed that the correlation coefficient between this percentage and per capita GNP was only 0. 35 in 1974 (for 120 countries). For an equivalent per capita GNP it is not unusual to find efforts twice or even three times as great. Thus, although one could accept the hypothesis of a quasi-functional relationship between levels of expenditure on education and GNP on the basis of the absolute figures, one needs to be far more circumspect with regard to the nature of this relationship when analysing the relative data (which here we term the 'effort' i. e. the percentage of GNP allocated to education).

A country's relative freedom of choice with regard to the allocation of public funds to education gives rise to a wide variety of situations, which can be classified schematically in the following manner:

		High growth rate	Low growth rate
Developing countries	High effort	I	II
	Moderate effort	III	IV
Developed countries	High effort	V	VI
	Moderate effort	VII	VIII

Some of the developing countries with a high economic growth rate devote a substantial effort to education (Group I which includes for instance Kenya and Ivory Coast) and this would appear to be more frequently the case in French or English speaking African states than elsewhere, if one is to believe the results of the multivariate analysis carried out in the study mentioned earlier[2].

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1. Eicher, Orivel : L'allocation des ressources publiques à l'éducation dans le monde, 1960-1974. Unesco - Statistical Office - Paris 1978 (awaiting publication).
2. Eicher, Orivel, op. cit.

Other countries (e. g. Brazil, Singapore, Hong Kong, the Republic of Korea[1]) also with high economic growth rates, make a far smaller effort, allowing private initiative to intervene so as to offset partially the lack of state involvement.

Others, despite substantial difficulties in achieving a satisfactory growth rate, nevertheless make a very great effort, as for example Cuba or Albania (Group II in the diagram, which comprises mainly countries with advanced socialist tendencies). However, most of the developing countries are to be found in Group IV, i. e. the group which devotes only a moderate effort to education and whose economic growth rate is unfortunately low.

As far as the developed countries are concerned, those which have experienced an above-average growth rate over the past 20 years, which mainly comprise Southern European countries (e. g. France, Italy, Greece, Spain and Portugal) plus the Federal Republic of Germany, tend to form part of the group which devotes only a moderate effort to education. On the other hand, those which make the greatest effort are to be found either in Northern Europe (in particular the Scandinavian countries, but also the Netherlands and the United Kingdom) or in North America and they belong either to Group V (e. g. Canada) or Group VI (e. g. the United Kingdom).

The Eastern European Socialist countries are in a middle position as far as the per capita income and the economic growth rate are concerned, but they are amongst the upper third in terms of the effort devoted to education.

The relationships between per capita GNP, growth rate and percentage of GNP allocated to education are therefore much more complex than might be supposed from the close correlations derived from the time series. This complexity and the uncertainty with regard to the nature of this relationship (is it linear, logarithmic, exponential or logistic?) make the task of forecasting public expenditure on education over the long term and even over the medium term both a difficult and a dangerous exercise. The extremely interesting work done by OECD on the trends in educational expenditure in member states[2] will enable us to throw more light on this problem by comparing the results of forecasts based on the trend between 1950 and 1967 and what actually occurred several years later. It will be seen that all the methods used, based on the hypothesis of the continuing invariability of a parameter which had in fact remained constant throughout the period of observation, are rendered invalid by the unforeseeable nature of the changes in the values for these parameters.

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[1] These countries belong to Group III which tends to comprise countries in Asia or Africa with market economies and on the verge of an economic boom.

[2] Trends in educational expenditure in the OECD countries: an analytical and methodological study - Paris, OECD, 1978, p. 60.

Consequently, it would be somewhat of a risky venture for us to attempt to draw up new forecasts - so we shall therefore be making very few. Rather than taking past trends in expenditure as a basis for defining a law with regard to their pattern in the future, we shall be attempting to put a figure, in terms of the mobilisation of resources, on objectives or forecasts of enrolment for various target dates in the future. In this instance, the hypotheses will be based on an assessment of unit costs rather than on the stability of certain parameters. This does not mean that these estimates are likely to be closer to the real situation in the future than those based on the analysis of past trends. Their main value lies in the fact that they may make a certain number of national or international policy-makers more aware of, on the one hand, the financial consequences of certain options with regard to enrolment and, on the other hand, of the dangers inherent in certain policies concerning the remuneration of teachers.

II. Methods of forecasting and their results compared with actual observations

1. Forecasting methods and their significance

When one observes an extremely close relationship between two variables over a given period, it is tempting to construct a forecasting model which assumes that this relationship will remain constant, if not over the long term at least over the medium term. If one has valid forecast for the one variable which is considered as being the independent variable, it is easy to deduce from this a forecast for the second, i.e. the dependent variable.

In the absence of an independent variable, it is quite possible to produce forecasts by extrapolating the values for the variable in question over a period which is long enough to enable one to adjust the trend, i.e. 10-20 years.

Lastly, if during the period of observation one discovers a swing of a structural kind, e.g. a regular increase (regardless of whether this is of a constant, ascending or descending order) in the percentage of GNP allocated to education, one can assume that this swing will continue and make due allowance for it in one's calculations.

All these methods are based on past trends. They are valid provided that the factors which have varied in the past will continue to vary in the same manner in the future. These methods were in extremely common use during the period from the end of the Second World War up to the early seventies, which was a period of exceptionally long and substantial economic growth throughout the world and this growth, to a certain extent, concealed the structural changes or reduced them to marginal importance. To take an example: in France, the budget for higher education between 1955 and 1969 was subject to a nominal annual increase of about 15 per cent. From 1969 onwards one notes a slight decline in this rate of increase, say from 15 to 13 per cent and then from 13 to 10 per cent. This could be termed a structural change - higher education's share of the total education budget as well as of the total national budget is declining. However, when one considers the actual changes in the budget itself, the magnitude of the decline (2-5 per cent) is substantially less than that for the trend (10-15 per cent) and could well be considered, over a given period, as accidental.

In other words, for 25 years everyone had acted as if elasticities higher than 1 could continue indefinitely, which is a statistical absurdity because inevitably one would reach a point in time when the part would be greater than the whole. One rather lost sight of the fact that economic values can only have a constant (i. e. exponential) growth rate for a limited period of time and that, over the long term, all variables behave either in accordance with a logarithmic pattern (LOGA) or a logistic pattern (LOGI), as shown in the following graph.

It will be seen that if a linear adjustment is made for the period between t_1 and t_i, one obtains fairly easily good correlation coefficients which incline one to extrapolate a continuance of the trend whereas, shortly after t_i, it begins to slow down, at which point the gap begins to widen rapidly between the actual values A and B and the forecast values A' and B' (the error being equal to the segments AA' and BB' respectively).

The most difficult problem facing those involved in preparing forecasts during periods of rapid growth is to decide the point at which the reversal of the trend and therefore the slow-down in the growth rate will begin.

The approach which we recommend in this report differs in two respects from the earlier methods:

1. First of all, it follows a period during which one has been able to witness, in a certain number of countries, this reversal of trend which could not have been foreseen with any degree of certainty in earlier forecasts. This reversal is clearly apparent in the trend for the elasticity of public expenditure on education in relation to GNP for the world's major regions (cf. Table 1, taken from Eicher, Orivel, op. cit.).

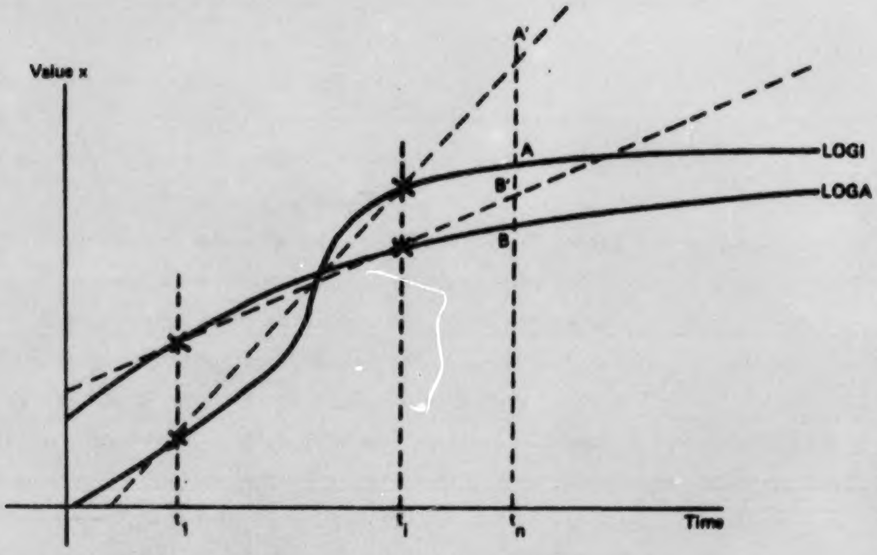

Figure 1

Table 1. The elasticity of expenditure on education in relation to GNP between 1960 and 1974

Region	Period 1960-65	 1965-70	 1970-74
WORLD TOTAL	1.98	1.48	1.04
Developed countries	1.90	1.46	1.01
Developing countries	2.29	1.64	1.43
Africa (excl. Arab States)	1.80	1.77	1.26
Arab States	1.38	1.49	1.07
North America	2.51	2.29	1.00
Latin America	2.09	1.38	1.79
Asia (excl. Arab States)	1.75	1.04	1.22
Europe (incl. USSR)	1.70	1.12	1.04
Oceania	1.77	2.00	1.67

The figures in this table represent the average annual elasticity for three periods, two covering five years (1960-1965 and 1965-1970) and one covering four years (1970-1974) - 1974 being the last year for which figures were available when the report was compiled. It will be seen that, for the world as a whole, this elasticity has dropped from a level of about 2 to a level approaching 1 during the course of the last 15 years. The drop is even more marked in developed countries than in developing countries and, amongst the more wealthy countries, those which are both the richest and those which make the greatest efforts (i.e. the US, Canada, Sweden, Finland) have even had an elasticity of less than 1 over the period 1970-1974, the average effort for this group of countries being between 7 and 8 per cent of GNP.

It is not unreasonable to conclude that there is an upper limit to expenditure on education of around 7-8 per cent of GNP and that the slower rate of decline recorded for the developing countries is partly due to the fact that their average effort is still relatively far from this upper limit (i.e. in 1974 an average of 4.1 per cent for developing countries as against 5.8 per cent for developed countries). It is interesting to note that the government of Kenya has recently decided to limit the growth in expenditure on education so that this does not exceed 7 per cent of GNP (the level already attained).

2. Secondly, we could have suggested using forecasts based on an extrapolation of the trend with an asymptote at 7 per cent, but this would have been somewhat of a gratuitous exercise. We thought it would be a better idea to attempt to calculate the probable cost of the growth targets for educational systems, which is a task which involves primarily the developing countries since the industrialised countries are close to the upper limit for resource allocation and, primarily for reasons of a demographic kind, no longer have any major new needs to meet.

By taking the population which one wishes to educate as the basis for estimating the expenditures required means that one is selecting the critical exogenous variable. The drawback with most models for analysing expenditures on education in relation to the level of development is the insufficient gap between what are considered as exogenous variables and the explained variable. Public expenditure on education is no more than a sub-set of the national budget, which in turn is a sub-set of GNP. The growth of GNP is not a purely exogenous phenomenon in relation to the national budget or the budget for education. The amount of steel produced by the French steel industry during a given year is a function of the amount of coke and ore fed into the blast furnaces, but it cannot be said that this is determined by the amount produced the previous year plus a growth rate obtained by projecting the trend or by assuming that the steel industry's value added will remain constant as a percentage of GNP or that the rate of increased in this percentage will remain constant - even if statistically these different methods produce the same result during a period of relatively steady growth.

In another context[1] we have shown that forecasts of student enrolment, even those of a sophisticated kind, based on extrapolations of past trends, have proved woefully inaccurate whereas even somewhat primitive tracer studies of cohorts have provided much better results, because the flow of students at level n for the year t is closely related to the number of students in level 1 for for the year t - n, provided one knows the rates of transition, repeating and dropout.

The same applies to a certain extent in our case. Expenditures on education depend on the numbers enrolled at a given unit cost and vice versa. Rather than take the statistical relationships between expenditures on education and GNP as our starting point, we shall deal with the crucial problem of unit costs and it will then be easy to simulate the financial consequences of different hypotheses regarding enrolment, the results of such simulations providing a possible means for revising the educational objectives adopted.

2. Some examples of forecasting

We shall quote two somewhat extreme examples to illustrate our point. The first of these is taken from a document forming part of a series of studies concerned with the long-term analysis of higher education in Europe up to the year 2000[2]. The forecasts calculated by the authors are as follows:

Table 2. Percentage of GNP allocated to university activities using various hypotheses

	Year	Minimal Hypoth.	Interm Hypoth^1	Interm Hypoth^2	Interm Hypoth^3	Maximum Hypoth.
Fed. Rep. of Germany	1980	2.5	3.3	2.5	3.6	4.8
	2000	4.1	5.4	5.9	10.0	19.0
Norway	1980	2.3	3.0	2.3	2.8	3.7
	2000	4.1	5.4	5.9	7.1	13.5
United Kingdom	1980	1.7	2.2	1.7	2.0	2.7
	2000	2.9	3.9	4.1	4.8	9.1

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[1] B. Millot, F. Orivel: L'allocation des ressources à l'enseignement supérieur français. Evaluation et rationalité. Doctoral thesis - University of Dijon, 1976.

[2] Berstecher, Dieter et al.: the University of the Future. The Hague, Nijhoff, 1974. Plan Europe 2000. Project 1 Vol. 6.

In fact, the actual effort devoted to higher education in these three countries for the last year for which figures were available when the report was written (1968) and for the last year for which figures are available at the time of writing this was as is shown in Table 3.

It could be said that the authors were unlucky because, in the three countries they chose, elasticity dropped to a figure approximately equal to 1 during the period immediately following a phase of sharp growth on which their forecasts were based. It will be seen that, on the minimal hypothesis, the effort would need to be quadrupled in Federal Germany between 1968 and 1980, tripled in Norway and increased by 55 per cent in the United Kingdom. It will come as no surprise that the country which makes the least effort (0.58 per cent) is the one which is supposed to have the most rapid growth rate and the highest final effort (as much as 19 per cent by the year 2000 which, it might be worth mentioning, would imply that one out of every five Germans would be full-time students in higher education, i.e. a total of over 12 million!) because the period of observation happened to be a period of catching up which, as we see, was not destined to last for ever.

It is very unlikely that there will be a new reversal of trend between 1974 and 1980 which will restore some credibility to these forecasts. If one takes for example the case of France, where a draft budget is already available for 1979 as well as provisional national accounts, the percentage of GNP allocated to higher education is not planned to exceed 0.45 per cent, i.e. substantially less than the 0.60 per cent of the years following 1968[1].

Our second example is derived from the OECD report mentioned earlier[2].

Table 3. Percentage of GNP allocated to higher education in 1968 and 1974

	1968	1974
Federal Germany	0.58	0.58
Norway	0.74	0.72
United Kingdom	1.10$^{(69)}$	1.07$^{(72)}$

Source: Unesco

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1. Although, in this connection, France must be considered as somewhat of an exceptional case in view of the modest level of its effort.
2. Trends in educational expenditure in the OECD countries: an analytical and methodological study - Paris, OECD 1978, pp. 52-56.

Table 4. Extrapolation of total expenditure on education(1) up to 1980, using three different methods

	% observed in 1967	(a) Extrapoln of the trend	(b) Extrapoln of the elasticity	(c) Extrapoln of elasticity of %
Germany	3.05 (1966)	5.6	3.7	3.8
Canada	6.42	19.9	23.8	19.0
Spain	3.0	-	5.0	-
United States	6.8	11.4	11.7	-
Finland	7.8	11.5	9.3	-
France	4.9	-	9.5	-
Greece	2.0 (1966)	3.9	4.0	-
Iceland	4.8	15.5	7.3	7.1
Japan	5.86	-	6.1	-
Norway	6.0	8.4	11.3	-
Netherlands	6.93	14.4	14.4	-
Turkey	3.92	6.9	7.5	-
Yugoslavia	4.59	12.0	3.2	-

(1) Total expenditures (public and private) on public education.

The forecasting methods used in calculating these figures are described by the authors as follows:

"(a) The annual growth rate for educational expenditure, using trends adjusted to the time series for the last ten or fifteen years (according to the rates of assumption B)[1].

"(b) The elasticity of educational expenditure in relation to gross national product, using the projections in the OECD study on economic growth from 1970 to 1980 and the regression equations given earlier[2].

"(c) The rise in the percentage of GNP devoted to education, using an extrapolation of the growth (exponential) noted during the period examined. Here the average annual growth rate was calculated between the first and last years of the period (generally 15 years) so as to take into account the long-term tendency."

When one examines these estimates and compares them with the actual figures at mid-period in 1974 (see Table 5) one notes that, except in the case of Iceland, Norway and Yugoslavia, the numerical differences due to the difference of method are of a lesser magnitude than the probable errors inherent in such estimates. In fact, the effect of the difference in method is no more than 10-20 per cent whereas the level of error is probably in the region of 50 per cent on average and as high as 200-300 per cent in certain cases (e.g. Canada, Iceland, Netherlands).

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1. Hypothesis B assumes that improvements in the productivity of education are similar to those for the economy as a whole. We shall be dealing with this point in section three.
2. These are arc elasticities estimated by means of a log - log regression: log Publ. Edn. Exp.$_{t_i}$ = a log GNP$_{t_i}$ + constant.

Table 5. Actual and estimated expenditure on education in relation to GNP

	Reference year 1967	% of GNP devoted to edn. in 1974 (publ. exp.)	Forecasts for 1980
Federal Germany	3.05	4.51	3.7- 5.6
Canada	6.42	7.96	19 -23.8
Spain	3.0	1.68	5.0
United States	6.8	6.34	11.4-11.7
Finland	7.8	8.11	9.3-11.5
France	4.9	5.09	9.5
Greece	2.0	1.75	3.9- 4.0
Iceland	4.8	4.78 (1971)	7.1-15.5
Japan	5.86	4.29	6.1
Norway	6.0	7.02	8.4-11.3
Netherlands	6.93	8.20	14.4
Turkey	3.92	5.64	6.9- 7.5
Yugoslavia	4.59	6.01	5.2-12.0

Sources: Col. 1 + 3 OECD, op. cit.
Col. 2 Eicher, Orivel, op. cit.

Admittedly, these figures are not entirely comparable, i.e. those for the year 1974 represent public expenditure on both public and private education, whereas the remainder represent both public and private expenditure on public education. In other words, in the first case there is an additional element in the form of public expenditure on private education and, in the second case, that of private expenditure on public education. Public expenditure on private education is likely on average to be slightly less than private expenditure on public education, which would result in the mid-period data being underestimated in relation to the forecast figures (particularly in the case of Spain, Greece and Japan where a drop is recorded whereas it is quite certain that there has been a rise).

Despite this, it is nevertheless clear that, in most cases, the forecasts are in double figures whereas it is highly unlikely that any of the countries listed in this table will reach a level of 10 per cent by 1980.

The countries where the degree of error is least marked are those which were late starters, like Germany, or the least developed amongst the group (e.g. Spain, Greece, Turkey, Yugoslavia) or those whose expenditure on education was increasing at a slower rate during the period concerned.

The hypothesis to which this comparison gives rise is that, at a given moment in a country's socio-economic evolution, their occurs a temporary quickening of pace, which has the form of a logistic curve where the percentage of GNP allocated to education rises from a level of less than 2 per cent to one of between 7 and 8 per cent. In many countries this movement took place during the course of the 25 years which followed the Second World War. It has been seen in the more developed countries in both northern Europe and North America. It has also been seen in countries whose level of economic development would not spontaneously have given rise to such an increase in the effort devoted to education - and this more especially in countries where there has been strong political support for this (the Socialist countries in particular) or in countries where education has been seen either as a means of speeding up economic development or as one of the benefits of modern society which should be distributed without delay, however expensive this might prove (e. g. African countries).

In section three we shall try to determine to what extent these policies have been well-advised or, on the contrary, ill-advised.

III. An attempt to estimate the resources required to finance the long-term objectives for the development of education throughout the world

The first two sections of this report may have given the impression that our approach is too negative and not constructive enough. In this third section we should like to correct this impression by making some positive suggestions. The estimates which we shall be proposing should be considered more as simulations than forecasts.

These simulations will be based on what seem to us to be the two determining factors in the allocation of resources to education, i. e. on the one hand, the numbers to be educated and, on the other, the osts per pupil.

(i) The numbers to be educated. The time has passed when we believed, perhaps somewhat optimistically, that universal access to education was just around the corner. One finds fewer and fewer policy objectives setting out precise timetables for increasing enrolment over the short term. Many of the poorer countries, which twenty years ago were thinking in terms of providing universal primary education within two or three decades, are now having to face the fact that their levels of enrolment are still very low and that there is little likelihood of any substantial increase in the rate of progress. This is why the new long-term projections, such as those contained in the Unesco Report of September 1977[1] are much more conservative and scarcely go beyond an extrapolation of the growth rate observed between 1960 and 1975.

(ii) The question of the cost per pupil raises problems of economic analysis which can prove controversial. Here we shall be putting forward the hypothesis that the most likely trend is that there will be an increase in unit costs similar to the increase in per capita GNP and that one should therefore not count on economic growth to satisfy new educational needs.

Using these two data bases and with the aid of several hypotheses which we shall attempt to justify, we shall be proposing simulations concerning the effort i. e. the percentage of GNP which will need to be allocated to education in the light of enrolment forecasts and the trend in unit costs. For different reasons which we shall be mentioning in due course, these simulations must be regarded as minima or lower limits because they give less weight to factors which tend to be inflationary in effect rather than to those, alas few in number, which tend to have a deflationary effect.

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[1] Unesco - Trends and projections of enrolment by level of education and by age - Statistical Office

1. The problem of costs per pupil

The problem posed by the past or future trend in costs per pupil is the problem of evaluating the productivity of education. A statement to the effect that educational expenditures have increased by 10 per cent (in constant terms) between 1977 and 1978 may mean:

- either that it has been possible to increase production of educational services by 10 per cent,
- or that the same amount of educational services has been produced but that the costs of production have increased by 10 per cent,
- or any intermediate combination of these two hypotheses.

When one examines the differences in unit costs on an international scale, and these are enormous (cf. Table 6 below), one can accept that, to some extent, these differences are differences of quality but that, for the most part, they are differences in costs of production. Economic theory has a very good explanation to support this view. The growth of per capita output per head, in any given country, is the result of the average increase in productivity in the various branches of the economy. The performance of certain sectors is well above the average, others come close to the average while some make little or no progress. It is a well-known fact that this is frequently the case with the service industries (e. g. hairdressers, domestic staff, hotel and restaurant services, etc.). The distribution of these improvements in productivity, in terms of personal incomes, does not correspond exactly with the degree of progress achieved since this would result in vast differences in income. In fact, what tends to happen is for there to be a relatively equitable redistribution based on the average, in such a way that those working in sectors where there is little progress in productivity find their pay increasing almost as fast, if not as fast, as per capita GNP. The adjustment is made by increasing the cost of production (and therefore the price) of the goods or services produced by these sectors.

This is roughly what happens in the case of education, with however some differences. The scale of expenditure per pupil in the table below corresponds approximately to the scale of per capita GNP - it even exaggerates it somewhat, because added to this are differences in quality, slight in relation to the others but real nonetheless. For instance, it can be assumed that in the poorer countries, teachers' qualifications are on average lower, working conditions less favourable, staffing ratios inferior, etc.

Table 6. Expenditure per pupil in primary education (US $ - 1974)

Region	US $
USA/Canada	1 734. 2
Europe	549. 2
Oceania	325. 4
Latin America	87. 0
Asia	78. 7
Africa	50. 4

Source: Eicher, Orivel, op. cit.

The effect of this situation on the progress of educational systems in developing countries is that one can expect that the growth of per capita GNP - for a constant educational effort and a constant educational quality - will be used to increase teacher's pay in real terms and not to increase the quantity of educational services provided. In other words, it will not be possible, on average, to increase enrolment levels except by increasing the effort, i. e. the percentage of GNP devoted to education. Similarly, only by adopting the same method will it be possible to increase 'quality'. Lastly, if the distribution by educational levels changes in favour of the higher levels and, in particular, higher education where unit costs are very substantial, the increase in effort will need to be more than proportional to the increase in total enrolment.

2. Projections or targets for enrolment

The document published by the Statistical Office of Unesco on the future trends for enrolment throughout the world is particularly interesting and comprehensive[1]. As we said in our introduction, it has to be considered as a cautious and conservative document. It is based primarily on what it proved possible to achieve in the way of progress in the past (and this alas has been modest) and it does not

Table 7. Projection of enrolment targets by major region and by educational level (gross amounts)

		1970	1975	1985	1990
World Total	1st level	85. [illegible]	87. [illegible]	91. 0	97. 7
	2nd level	35. 7	39. 0	43. 6	46. 2
	3rd level	9. 3	10. 6	11. 7	12. 0
	Total	47. 5	48. 9	52. 3	54. 7
Developing countries	1st level	70. 8	75. 8	83. 7	92. 9
	2nd level	22. 0	25. 9	33. 1	38. 6
	3rd level	3. 1	4. 0	5. 7	6. 9
	Total	36. 9	39. 7	45. 4	49. 5
Africa	1st level	59. 3	68. 5	81. 5	95. 4
	2nd level	10. 6	14. 5	22. 6	29. 3
	3rd level	2. 0	2. 8	3. 3	4. 3
	Total	27. 7	32. 6	41. 2	48. 6
Latin America	1st level	102. 4	110. 5	121. 4	130. 6
	2nd level	20. 2	27. 4	37. 7	43. 7
	3rd level	5. 4	9. 4	15. 2	18. 8
	Total	49. 2	54. 8	63. 8	69. 0
Asia(1)	1st level	66. 4	69. 4	75. 0	81. 6
	2nd level	25. 9	28. 4	34. 7	40. 0
	3rd level	3. 2	3. 5	9. 2	5. 1
	Total	36. 6	38. 0	41. 9	44. 5
Europe(2)	1st level	113. 5	110. 9	112. 9	113. 6
	2nd level	66. 9	77. 7	88. 0	91. 0
	3rd level	12. 0	15. 4	18. 5	20. 9
	Total	65. 3	68. 6	72. 3	76. 0
Developed countries	1st level	119. 6	119. 9	117. 3	119. 3
	2nd level	62. 6	68. 2	76. 1	76. 9
	3rd level	19. 7	22. 9	26. 8	30. 3
	Total	68. 8	69. 9	73. 3	75. 8

(1) Excluding Japan, China, Korea and Mongolia

(2) Excluding USSR.

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[1] Unesco, *op. cit.*

recommend ambitious targets which would be difficult to achieve. No developing country is expected to equal the enrolment levels of the developed countries by the year 2000. It confines itself therefore to objectives which are conservative compared with those which used to be formulated in this area. We have extracted from this report the figures as shown in Table 7 which concern the world's major regions and the different educational levels.

3. Recapitulation of the percentage of GNP allocated to education by major regions in 1970 and 1974

	1970	1974
World Total	5.39	5.45
Developing countries	3.36	3.94
Africa	3.52	4.15
Latin America	3.38	4.25
Asia	3.57	3.97
Europe	4.90	4.90
Developed countries	5.67	5.68

4. Level of effort required in 1985 and 2000 assuming unit costs to be the same for all three levels

This could be calculated in several ways:

- either by calculating the share of GNP required to enrol 1 per cent of the school-age population and multiplying this figure by the projected levels of enrolment (disadvantage: this means assuming that the fixed costs are nil);
- or by extrapolating the cost of the additional percentage between 1970 and 1974 (disadvantage: period somewhat short and therefore wide margin of error);
- or by calculating the percentage increase in the level of enrolment and applying this figure to the effort. This method seems to us to have the least drawbacks and is therefore the one we shall be using.

	Enrol. level 1974 (1)	Enrol. level 1985	Enrol. level 2000	% ↗ 1974-1985	% ↗ 1974-2000	% GNP 1974	% GNP 1985	% GNP 2000
Africa	31.6	41.2	48.6	30.4	53.8	4.15	5.41	6.38
Latin America	53.7	63.8	69.0	18.8	28.5	4.25	5.01	5.46
Asia (2)	37.7	41.9	44.5	11.1	18.0	3.60	4.00	4.25
Developing countries	39.1	45.4	49.5	16.1	26.6	3.94	4.57	4.99
Developed countries	69.7	73.3	75.8	5.1	8.7	5.68	5.97	6.17

(1) Calculated by interpolation using the figures for 1970 and 1975.

(2) Excluding Japan and China.

The patterns for the three sub-sets making up the developing countries' universe are very different. Latin America, which is the most developed of the three, currently has the highest level of enrolment. By the year 2000 it will be close to that of the developed countries. This result will be achieved at a relatively acceptable cost in terms of effort since, at that date, this will amount to 5.5 per cent of GNP, i.e. the same as the current effort of the developed countries, and for a level of enrolment (69 per cent) again equivalent to that of the developed countries today.

In Asia the situation is more worrying. The expected increases in enrolment levels have been extremely slow and this will be the most backward region by the year 2000. By that year, the developed countries will still have a level of enrolment 70 per cent higher than that for Asia for an effort only 45 per cent greater. In other words, despite very low costs, education in Asia will constitute a relatively heavier burden than in the developed countries.

Lastly, Africa gives real cause for concern. The forecast enrolment levels used here reflect a tendency to make rapid progress in the distribution of education since, although it started well behind Asia, it expects to overtake this region during the period. Such progress will however constitute a heavy drain on its resources. By 1985, for an enrolment level 78 per cent below that of the developed countries, it will need to devote an effort only 10 per cent lower. By 2000, for an enrolment level which is still 56 per cent lower, it will need to accept a higher level of effort. To a large extent, this is due to the pay structure in Africa. The annual salary of teachers in primary education throughout the world generally falls within the range of the per capita GNP figure and twice this amount. In Africa however these limits are often exceeded and we have noted for example that in Ivory Coast the ratio was 1: 10 and in Kenya 1: 5[1].

5. Level of effort required in 1985 and 2000 assuming that the structure of unit costs per educational level remains the same as at present (the case of Africa)

Our assessment of the effects of such structural changes will be confined to the case of Africa because it is here that these are the most important and also the most alarming. In fact, although the costs per pupil in primary education are low in this region, the same cannot be said of higher education - according to the Eicher-Orivel study, already referred to, in 1974 per capita costs for higher education were 59 times those for primary education - for various reasons, amongst which we would mention the small number of students per discipline, the employment of highly paid European professors and the allocation of grants to students, often even to those whose parents belong to the more wealthy social classes.

We have no figures for the costs per pupil in secondary education but, in any case, the assumption that these are twice the cost per pupil in primary education in our view constitutes a minimum.

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[1] See Eicher, Orivel - Analyse des coûts de l'enseignement primaire télévisuel en Côte d'Ivoire - IREDU, University of Dijon, 1976.

In other words, enrolling one more student in secondary or higher education is equivalent to enrolling, in the first case 2 and, in the second case, 59 additional pupils in the primary level. On this basis one can then calculate a notional enrolment level by expressing all the figures in terms of equivalent primary pupils.

	Primary pupils (000)	Secondary pupils (000)	H. Education Students (000)	Equivalent primary pupils (000)	Actual enrol. level %	School-age population (000)	National enrol. level %
1975	44 243	7 811	865	103 089	32.6	186 868	55.2
1985	71 411	15 967	1 943	217 982	41.2	216 799	100.6
2000	127 483	32 884	3 967	460 188	48.6	338 136	136.1

The notional level of enrolment would therefore have to increase by 82 per cent between 1975 and 1985 and by 146.6 per cent between 1975 and 2000, which would mean an effort equal to 7.55 per cent of GNP in 1985 and 10.23 per cent in 2000.

The effect of the high costs of higher education in Africa is therefore considerable, i.e. almost four additional percentage points of GNP by the year 2000, which in our view is neither possible, desirable nor reasonable. Some very serious thought therefore needs to be given to finding ways of preventing a halt in the growth of enrolment in Africa. In particular, a reduction in the costs of higher education in a number of countries would seem imperative over the long term.

The long term prospects for the development of education in the developing countries are therefore somewhat mixed. The situation in Latin America would appear, on the whole, to be fairly favourable. Amongst the Third World regions it will be the first to achieve enrolment levels similar to those of developed countries. Progress in Asia looks like being particularly slow if past trends continue; however, this progress has at least the merit of not representing too heavy a burden on national resources. Africa devotes a considerable effort to education which is still insufficient in relation to its needs, but perhaps excessive in relation to its resources. Already, in the African countries, education constitutes a drain on resources which hinders the financing of other priorities essential to development. One must not lose sight of the fact that these countries are very poor and their resources tragically limited.

If one takes a country like France, for example, one would need to go back a hundred years at least to find an equivalent level of development. A hundred years ago however, its public expenditure on education did not exceed one tenth of one per cent of GNP. Although it is impossible to make strict historical comparisons of this kind, mutatis mutandis, one would do well to give serious thought to some of the orders of magnitude involved.

This report can obviously provide only a partial and incomplete picture. It would be interesting to follow up this analysis of the major regions by an analysis of a certain number of individual countries and, in particular, those farthest removed from the average and whose problems are likely to be the most serious in the very near future.

SEX ROLES, EDUCATION, AND DEVELOPMENT IN AFRICA

by Niara Sudarkasa

With three quarters of the twentieth century behind us, throughout most of the world, sex, race, ethnicity, and/or income are still *de facto* if not *de jure* bases of differential access to opportunities and resources. In the realm of education, sex is characteristically the primary basis of the inequalities that exist in most countries. In the 'developing' nations, educational delivery systems are directed mainly towards males. Women partake of formal and non-formal education in fewer numbers and for shorter periods of time than do men. At the higher levels of schooling, women and men typically pursue different courses of study.

The differences in the availability of education to women and to men, and the different choices the two sexes make as regards educational opportunities that *are* open to them, are directly linked to the sex rôle differences that exist in the societies at large, most especially to differences in occupational rôles and expectations. Evidence of a division of labour along sexual lines can be found in most countries, but in the non-western world, this division of labour is often most pronounced and most pervasive. Africa is a prominent case in point. Thus, when we approach a discussion of the future of education in Africa or of education for Africa's future, we must grapple with the question of maintaining a division of labour which utilizes sex as one of its underpinnings.

Although some writers have answered this question by advocating what one critic termed the 'western concept of *mechanical equality* [between] the sexes', and others have been equally critical of notions of occupational preserves (or reserves) for one sex or the other[1], it is the view of the present author that the discussion of sex rôle differentiation in education and in occupations must take place within the context of a consideration of the present and projected structure of society in the parts of the world under consideration.

In this paper, I examine the question of sex rôle differentiation in education and occupations against the background of the realities of contemporary Africa and in light of some of the projections that have been offered for societal transformation in that part of the world. The paper is an exploration of, rather than an exposition on, various issues connected with the future of education as it impacts upon women and sex rôles in Africa.

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[1] Boserup, Ester. *Woman's rôle in economic development.* George Allen and Unwin, Ltd., London, 1970, p. 216.

Sex rôle differentiation in education and occupation in indigenous African societies

The division of labour by sex which exists in contemporary Africa is rooted in the values and customs of the indigenous societies on the continent and in the legacy of sex rôle differentiation bequeathed to these societies by the former colonial regimes.

Typically, in indigenous African societies, the occupational rôles of women were different from but complementary to the rôles of men[1]. The particular occupation of women varied somewhat from society to society but generally, women worked in agriculture, food processing, marketing, crafts production, and in domestic activities located more strictly 'in the home'. Very often men and women worked in the same occupation (for example in farming or trading) but the tasks undertaken tended to be sex-specific (for example, preparing the land for farming versus tending the crops, or trading in one line of goods as opposed to another). There does not seem to be a basis for holding that women's occupations were considered to be 'inferior' to those of men, although such occupations were usually thought to be *inappropriate* for men, just as men's occupations were normally considered inappropriate for women. The point here is that the maintenance of separate occupational domains for the two sexes did not automatically imply a hierarchical relationship between those two domains[2]. (And of course not all work was sex specific). It would also seem inappropriate to view the traditional work of women as 'drudgery' if that is meant to imple that men's work was not. Men *and* women in the fields ; both sexes carried heavy loads, walked long distances in trade, etc. Women may have spent long hours tending crops, pounding grain or collecting fire wood, but men also spent long hours felling trees and clearing the bush for farming, tending and harvesting crops, building and maintaining dwellings, etc.

Given the interdependance and relative parity of male and female *economic* rôles in most precolonial African societies, if one were to apply the 'beast of burden' stereotype to women one should also apply it to men. The disparities that are evident in the economic rôles of men and women in contemporary Africa are for the most part resultant from socio-economic changes that have taken place in the twentieth century.

In light of the foregoing discussion, it should be evident that occupational (or vocational) *training* in precolonial Africa was also differentiated along sexual lines. However, this training, which was usually provided through 'formal' (i.e. structured) apprenticeship arrangements, was available to women as well as to men. A craftsman or woman, health or religious practitioner, griot, etc., each received a 'formal' education through apprenticeship programmes of varied duration. Training for some occupations, such as farming or trading, did not usually involve formal apprenticeships, however, the trainee received years of tutelage (often from a parent) before being set forth to work on her or his own.

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[1] Sudarkasa, Niara, "Female employment and family organization in West Africa", in *New research on women and sex rôles*, D. McGuigan, ed. University of Michigan, Center for continuing education for women, 1976. Rousseau, Ida. "Africa women: Identity crisis ...?" in Women cross-culturally, R. Rohrlich-Leavitt, ed., Mouton, The Hague, 1975.

[2] Sudarkasa, *Ibid.*

Education in precolonial Africa was not limited to specialized vocational training. As the late JomoKenyatta, Africa's most illustrious anthropologist, illustrated for the Kikuyu, in African societies, all persons female and male, were given a general education in addition to training in specific occupational skills[1]. Another eminent African educator, President Nyerere of Tanzania, described African education in the following manner:

> "The fact that pre-colonial Africa did not have "schools"-except for short periods of initiation in some tribes -did not mean that the children were not educated. They learned by living and doing. In the homes and on the farms they were taught the skills of the society, and the behaviour expected of its members. They learned the kind of grasses which were suitable for which purposes, the work which had to be done on the crops, or the care which had to be given to animals, by joining with their elders in this work. They learned the tribal history, and the tribe's relationship with other tribes and with the spirits, by listening to the stories of the elders. Through these means, and by the custom of sharing to which young people were traught to conform, the values of the society were transmitted. Education was thus 'informal'; every adult was a teacher to a greater or less degree. But this lack of formality did not mean that there was no education, nor did it affect its importance to the society. Indeed, it may have made the education more directly relevant to the society in which the child was growing up"[2].

Thus, even though schooling and literacy were not features of most pre-colonial African societies, education was not only important, it was universal for all freeborn members of these societies.

This is a point worth stressing because many western scholars and lay persons seem to take the view that there was no tradition of education in indigenous Africa. Perhaps these persons would argue that the process of transmission of knowledge which took place in those societies should be subsumed under the concept of socialization, while reserving the concept of education to refer to the schooling process which developed in the Islamic world, in Europe and elsewhere. This rather narrow view of education underlies H. M. Phillips' observation that:

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1. Kenyatta, Jomo, Facing Mt. Kenya, Vintage Books Edition, New York, 1965, Chap. 5.
2. Nyerere, Julius K. "Education for self-reliance" in Tanzania: Revolution by Education, I.N. Resnik, ed., Longmans of Tanzania, Arusha, 1968, pp. 49-50.

> "In Africa, education was extremely limited and associated with the very small numbers who were in contact with Islam over the land routes and later with Europeans in the ports or administrative centres already starting to be set up in those parts of Africa which were colonized. But basically the continent as a whole was still completely underdeveloped and tribal. African potential, though great, was late in being mobilized[1]".

The transformation of occupational rôles and educational patterns in twentieth century Africa

Since the publication of Ester Boserup's Women's rôle in economic development in 1970, a number of scholars writing on Africa have pointed out various ways in which the processes of 'modernization' and 'development' have served as constraints on women's full participation in the economic and political arenas in their countries[2]. The complementarity and near parity of male and female occupational rôles found in many indigenous economies were eroded by the spread of the market economy. Of course it was not just women's rôles that were affected by the expansion of capitalism in Africa. Males as well as females found that much of their 'traditional work' was rendered nearly obsolete by the introduction of new goods and/or new technologies. They also found that in most cases they were forced to occupy the lowest levels of the economic pyramid because of the absorption of foreigners, typically Europeans and Asians, at the highest levels of that pyramid.

But in the case of African women, they not only experienced the general displacement caused by the colonial regimes, they also found that their economic status generally deteriorated vis-à-vis that of their male countrymen. Where women continued in their traditional occupations, as in the case of traders or farmers, they often found their opportunities circumscribed because of the preference which the expatriate business community and/or governmental bureaucracy had for dealing with them. Extensions of sizeable amounts of credit typically went to male traders rather than to women; innovative productive techniques were usually introduced to male farmers rather than to their female counterparts[3]. The migration of women from the rural areas to the cities often meant that if they did not work as petty traders, food sellers, or the like, they could not find work at all, and what had been economically a relatively independent female population found itself increasingly dependent on males for support[4].

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1. Phillips, H. M., Basic education - a world challenge, John Wiley and Sons, New York 1975, p. 24.
2. See, for example, Van Allen, Judith, "Women in Africa: modernization means more dependency", Center Magazine, Santa Barbara, California, 7:3:1974:60-67; Mbilinyi, Marjorie, "The 'new woman' and traditional norms in Tanzania, Journal of modern african studies, 10:1:1972: 57-72; Pala, Achola, "African women in rural development", Overseas liaison committee, American Council on Education, Washington, D. C. 1976.
3. Sudarkasa, N. Where women work: a study of Yoruba women in the marketplace and in the home. University of Michigan, Museum of anthropology, 1973.
4. Sudarkasa, N. "Women and migration in contemporary West Africa", in Women and national development, Signs 3:1:1977.

With the demise or near demise of various traditional crafts that had provided a livelihood for large numbers of the female population (crafts such as pottery making, weaving, dyeing, soap manufacturing, etc.) women found that if they were to work at all, they had to join the ranks of the petty traders, thereby rendering that level of commerce even less remunerative than it had come to be[1].

At the center of the problems facing the mass of twentieth century African women has been their near exclusion from the wage sector of their economies and their having to face various financial barriers to their movement from the lowest levels of commerce and food production into economic activities dominated by expatriates or African males. In both instances, the very fact of being female was often enough to call for discriminatory treatment. However, one very important factor in the process by which women came to be 'underdeveloped' in Africa, has been their lack of the educational credentials which would enable them to enter into certain modern occupations or to expand the scale of their commercial or productive activities. Of course being female was a barrier to participation in the educational systems themselves.

When we survey the education of women in contemporary Africa, we find ourselves reviewing a familiar pattern. The vast majority of African women have no formal or non-formal education of the Western type. Taking the average of all African countries, the median educational attainment for women in the age groups 15-24 is not up to two years. The median level of education for women aged 35-64 is less than one year. Eighty-five per cent of all African women are illiterate[2].

It should be noted, however, that most African women still do receive a traditional form of vocational or occupational training. That is, they are instructed by their mother or other female relatives with whom they live and work until they marry, at which time they usually begin to work on their own. It is my impression that nowadays quite a sizeable number of young women (at least those in West Africa) acquire some degree of training in certain skills (of which sewing is the most popular) through small privately run 'vocational schools'. These 'schools' or 'institutes', as they are often called, are usually held in a woman's home or in a small shop which she rents. The running of such 'institutes' has become a form of business for a number of women who are themselves small scale entrepreneurs. Girls enrolling in these 'vocations institutes' often would have had some primary schooling, but that is not usually a prerequisite for entry.

United Nations data from 1969 show that in the primary schools, on the average, girls students constituted 36 per cent of the total enrolment[3]. These data also show that girls enrolled in primary school comprise 49.8 per cent of all the African girls of primary school age. Some of these female students were undoubtedly older than the official cut-off age for the primary school population, hence, the percentage of primary school age girls who were actually enrolled in school

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1. Sudarkasa, N. "Commercial migration in West Africa, with special reference to the Yoruba in Ghana", African urban notes, Series B, No. 1, 1974.

2. Boulding, Elise, et al. Handbook of international data on women, Sage Publications, John Wiley and Sons, New York, 1976, pp. 138, 142, 144.

3. UNECA, Human resources development division, African Training and Research Center for Women, "Women and national development in African countries: some profound contradictions", African Studies Review, XVIII: 3: 1975, p. 57.

was less than 49.8 per cent. These statistics for sub-Saharan Africa compare with the figure of 100 per cent enrolment of all primary school age girls in Europe and North America; approximately 57 per cent enrolment of all primary school age girls in North America and the Middle East; approximately 76 per cent enrolment of primary school age girls in Asia; and an approximate 100 per cent enrolment statistic for Latin America[1].

The data on enrolment in secondary schools show that in twenty-five African countries girls constituted between 8 per cent and 28 per cent of the student population in 1969. Of the four African countries in which girls constituted between 30 per cent and 40 per cent of the secondary school population, two (Zambia and Dahomey) are Black African states. Interestingly, it is in the southern part of the continent (Swaziland, Botswana, Lesotho, and Malagasy Republic) that girls make up between 42 and 52 per cent of those attending secondary school[2]. (These statistics probably reflect the fact that young men in the three countries bordering South Africa migrate to work in the mines rather than remain at home to attend school). It should be noted that the females enrolled in secondary schools in 1969 comprised only 4.5 per cent of all girls of secondary school age[3]. Obviously, there is a very high rate of female attrition between the first and second levels of schooling in Africa.

At the university level in 1967, African women constituted between one per cent and ten per cent of the student population in eight countries. They were between 10 per cent and 20 per cent of the university student population in eleven countries. Only in three North African countries (Tunisia, Algeria and Egypt) did women constitute more than 20 per cent of the university student population[4]. In 1972, women comprised 16.6 per cent of the African students enrolled in universities, teacher training colleges, and technical colleges.

Generally, the data on education in Africa show that girls enter schools in smaller numbers than boys and that they leave at an earlier age. Outside of primary school, they typically enroll in shorter cycle courses such as are offered by small private 'vocational training' schools. Information on the fields of study which women pursue at the higher levels of formal education show that they have clustered in those areas which the colonial educators first defined as appropriate for women: elementary school teaching, nursing, and other health related fields such as domestic science or home economics[5]. Of the professional fields, law and medicine are the two that attract most women, but the proportion of women in these fields is typically under twenty per cent in all countries. Women who pursue academic careers predictably end up in education, the arts, or social sciences.

Overall then, it can be said that the spread of the market economy in Africa adversely affected the economic status of women, turning sexual differentiation within the economic sphere into sexual discrimination within that sphere, and that the spread of Western education also served to increase the economic gap between male and female because on the one hand, most women were not exposed to the advantages that attached to being educated, and on the other hand, most educated women were channeled into occupations that were lower paying and/or less prestigious than those held by educated males. Of course, higher education has enabled some women to move into positions comparable to that of men, where this has been the case, such women have often experienced less prejudice and differential treatment than Western women in comparable positions. However, the point being made here is that on balance, westernization in the occupational and educational spheres has widened rather than narrowed the gap between males and females. This could and did occur while at the same time the position of women was in various ways being improved by their exposure (however limited and in whatever limited numbers) to Western education[1].

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[1] Boulding, et. al. op. cit., p. 150.

[2] UNECA, op. cit., p. 60.

[3] Boulding, et. al., op. cit., p. 153.

[4] UNECA, op. cit., p. 60.

[5] Boserup, op. cit., Chapters 7 and 12.

Occupational and educational sex rôle distinctions and the future social order in Africa

Many of the discussions of the future of women's education in Africa include generalities concerning the necessity of providing equal access for women to schooling at all levels and of training women for occupational rôles (such as that of engineer) presently dominated by men. It would appear, however, that a number of considerations should precede any prescriptions, however tentative, concerning the desirable quantity or quality of education for Africa's female population. (Some might want to challenge the legitimacy of speaking at all about education for women, maintaining that we should simply discuss education for people - old and young - in the societies concerned. It is hoped that ample justification for the focus on education for women will be provided in the next section of this paper).

Among the 'broad issues' to be considered in discussing women's education and the future of Africa or the future of women's education in Africa are the following:

(1) What is to be the nature of the social order for which women are being educated and in which future generations of women will be educated? What are the values undergirding this social order? What are some of the distinctive features of the basic institutions that make up that social order?

(2) Is this new order to be achieved through directed 'social engineering' or is it envisioned as resulting from the cumulation of a somewhat more discrete, less manipulated series of changes?

(3) To what extent is education being viewed primarily as a catalyst rather than as a consequence of movement toward this new social order?

(4) To what extent must the present realities of life in African societies, most especially in the present discussion the realities of the life of women, guide decision-making as to the direction, rate, and/or magnitude of social (including educational) change?

These are obviously questions to be raised for discussion rather than ones for which we have definitive answers.

In relating the first broad question to the discussion of sex rôle differentiation in education and occupations, one issue that must be dealt with head on is the questions of whether the future social order envisioned by African peoples (or by their social engineers) is one in which sex rôle distinctions are virtually obliterated. Is it desirable to move toward the creation of a society in which virtually all rôles are androgynous rôles? If there is any hesitancy about answering this question in the affirmative, then educational planners must ask to what extent would the obliteration of sex rôle distinctions in education and in occupations have negative implications for the preservation of valued institutions or life styles that have their genesis or their existence rooted in sexual distinctiveness.

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[1] Of course it is relatively commonplace to find that the economic status of one group improves over time without improving vis-à-vis a superordinate group, viz, the situation of the black population in the U. S. A. vis-à-vis the white population in that country.

Analysis of present day African societies would suggest that advocating the evolution toward androgynous roles would not receive widespread support. African women have consistently maintained that one of their differences with Western women's liberation movements concerns the fact that some of the latter's spokeswomen are "anti-male" or they seek to obliterate sex rôle distinctions between male and female. There are practically no indications that the male population in Africa would support the "androgynization" of rôles. The tentative moves toward what Mazrui has termed "androgynous liberation" through the incorporation of women into the ranks of the freedom fighters in Guinea Bissau and in Southern Africa do not appear to have social corollaries in other realms of society[1].

The family, which is still the most important institution in African societies, is rooted in sex rôle differentiation. The African family is built up around the two principles of conjugality (represented in the husband-wife relationship of polygynous as well as monogamous marriages) and consaguinity (represented by the lineage which forms the core of the compound-base extended family). In both the conjugally based immediate family and consaguineally based extended family, separate contributions are expected of males and females in material as well as non-material realms. Although there is much more sex rôle flexibility within the African family than is indicated by stereotypic and misleading interpretations of husband-wife rôles,[2] there is no ideology of sex rôle interchangeability within these units.

Any educational policy decisions that lead in the direction of eliminating sex rôle distinctions should be scrutinized for their possible impact on the family. Obviously African families can and will change. The question, however, is in what direction and to what extent[3].

Another point to be made in connection with the discussion of the possible elimination of sex rôle distinctions concerns the strength of same-sex solidarity in African traditions and in contemporary life. Africa is a continent on which same-sex associations (i.e. 'sodalities', 'guilds', 'age-grades' and the like) have a long history and a thriving existence. Interestingly, Western women's liberation movements are just now seeking to create the sense of solidarity that can sustain women's associations of the type that have always been a feature of African life. It would seem that

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1. Mazrui, Ali, "Gandhi, Marx, and the warrior tradition: towards androgynous liberation", Journal of Asian and African Studies: XII:1-4, 1977.
2. Rosaldo, Michelle, "Women, culture and society: a theoretical overview", in Woman, culture and society, M. Rosaldo and L. Lamphere, eds., Standford University Press, 1974, pp. 20-22.
3. I am not aware of any research specifically relating to changing concepceptions of sex roles within the African family.

the education of women away from those values that have nurtured and sustained this sense of sisterhood (values that stress the differences between male and female) could have adverse political as well as social implications. It is precisely such all-female associations and movements that have the potential for being highly effective instruments for the attainment of equality and equity in the political and economic realms.

The ideology of female liberation in Western societies explicitly or implicitly promotes the view that equality of the sexes leads (or should lead) to the elimination of sex rôle distinctions. In the United States, the trend is for educational institutions, particularly the publicly supported ones, to integrate this viewpoint into their curricula.

The study of the pre-colonial political and economic structures and of certain linguistic features of a number of African societies suggest that parity or near parity between the sexes in the economic sphere resulted from, or was at least correlated with, the maintenance of essentially separate 'domains' for males and females[1]. A challenge facing contemporary Africa, in which sex rôle differentiation still exists but in which near parity of the sexes has been replaced by the subordination of women, is whether or not a new social order can be created in which the positive features of same-sex solidarity and of sex rôle complementarity can be combined with social justice and political and economic equality for females as well as for males.

It is being suggested, in other words, that as regards the issue of sex rôle differentiation in occupations and education, indigenous African models might provide a basis for change in a direction that is both culturally acceptable and socially progressive.

The education of women to fill certain occupational rôles (and correspondingly, the education of men to fill certain complementary ones) should not be taken as an *a priori* sign of unfair or unequal treatment of women. Societies can determine the remuneration to be given for the various occupational rôles within them. There is no *a priori* reason why physicians, for example, should be paid more than nurses (and certainly not on a life-long basis), or why elementary school teachers should earn less than college professors. Similarly, the fact that farmers are economically less well off than some other professionals is a function of the type of economic order under which they live rather than of the nature of the work they do. The prestige which attaches to certain occupations and the lack of respect for others are likewise *culturally* manipulable. So long as discussions of sex rôle differentiation in occupations and education *presume* the continuation of a political and economic order which thrives on inequalities of various sorts (that of the sexes being only one), the 'solution' to the problem of the injustices caused by these inequalities will continue to be elusive.

Educating women for Africa's future

What are the implications for educational development of the realities of the present position of women in Sub-Saharan Africa and of the prevailing attitudes toward and the institutionalization of sex rôles on that continent? In other words, given the existence of sex rôle differentiation in various spheres, how do we approach the problem of including both sexes in any plan for educational development? It is necessary first of all, to accept the remise that:

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[1] Lebeuf, Annie, "The role of women in the political organization of African societies" in Women of Tropical Africa, D. Paulme, ed., Mouton & Co. the Hague, 1960, Sudarkasa, *op. cit.*, 1973

> "If all of the persons who are involved in the human tasks of survival and creation of a better life are allowed to share the opportunities available to apply scientific knowledge and technological advances, development will be achieved at the most rapid rate possible. conversely, if some persons are left outside the stream of this knowledge, the pace of development will be slowed down for the whole society. And the latter is particularly true if those left out play a major part in economic production and are at the same time the persons who bear the chief responsibility for the health and well-being of all the people[1]".

If it is accepted that both sexes must be included in all plans for development, then we can proceed to ask how this will be achieved. We are aware that according to indicators currently used in the measurement of educational development, African populations generally are 'in the worst position of the developing regions[2]". In 1970, less than half of the children of primary school age were actually enrolled in school. And, as was pointed out in a preceding section of this paper, only about one third of those enrolled in primary school and less than five per cent of those enrolled in secondary school were female.

Moving into the twenty-first centrury, then, Africa faces the problem of 'playing catch up' with the rest of the world as far as its overall educational development is concerned, and it also faces the problem of closing a rather substantial gap between the education preparedness of its male and female populations.

Much of the discussion in educational circles today concerns the possibility of providing for all the world's populations a 'minimum basic education', i.e. 'literacy, numeracy, and elementary knowledge of the environment, of health, of civics and of standard moral codes'[3]. Regardless of the position one takes as to the proportion of the educational budget that should be devoted to this minimal education, it would seem that some form of universal basic education (with the terminabilility that implies), or of universal primary education, is a necessary goal for all states concerned with development for the masses rather than just for the few.

The recruitment of girls on a completely equal footing with boys is implied in the concept of universal basic education, however, governments should take special measures to see that female students are not allowed to drop out of these programmes in larger percentages than boys. This is a special likelihood in cases where the age of entry into the programme is raised to eight or nine years and/or the duration of the programme is more than four years. Parents might find it 'necessary' to remove girls of about twelve years of age from school in order to be of assistance in the home, on the farms, or elsewhere.

Provision should also be made for females to have equal access to the channels leading from the basic education level to higher levels of education. Realities of life in Africa are such that even with policies of open enrolment, females will probably not move into higher education in as large numbers as males. It will be extremely important, therefore, for there to be a vigorous and imaginative programme of non-formal continuing education for women in the places where they work and in the communities at large. In fact, such programmes should be planned and funded alongside programmes for basic education because it is through the extra-classroom educational experience that literacy, numeracy, etc. can be provided for the women (and men) who constitute today's illiterate parent generation.

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[1] UNECA, op. cit., p. 47

[2] Phillips, op. cit., p. 39.

[3] Ibid., p. 8.

The reality of differential enrolment rates and attrition rates for males and females (especially beyond the basic level) means also that special supportive services should be provided for women to ensure that as many as possible of those who enter the higher educational levels will in fact complete the courses they start. Given the strong male biases of existing educational institutions, it is likely that if women are not given special supportive counselling and academic services, large numbers of them will not have the motivation nor receive the attention necessary to succeed.

With respect to occupations or career goals, it would seem that all fields should be open to both sexes, however, if for various reasons women continue to self-select or be channeled into certain fields, one aim of governmental policy should be to ensure that these fields not become or not remain 'second class' occupations by virtue of the differential rewards attached to them.

In any case, it is unrealistic to assume that in the foreseeable future the masses of African women (most of whom, in any case will probably be recipients of only the basic level of education) or the masses of African men will be engaged in any occupations other than those of farming, trading, food processing, and the like. So long as the tasks in these areas tend toward sexual specificity, then the mass of children will be socialized to think in terms of a sexual division of labour. Thus even when these children have the opportunity to move to higher levels of schooling they would probably self-select occupations in which members of their own sex predominate.

In Africa today, as in the rest of the world, women will tend to move into or be channeled into lower paying, less prestigious jobs than those occupied by men. The higher up the occupational or educational ladder, the fewer the women to be found there[1]. Efforts to remedy this situation by providing 'equal access' for women to the higher rungs of the ladder have failed because (1) the process of change is too slow so women do not in fact 'catch up', and (2) too many factors intervene to prevent *de facto* equality of access from occurring.

Nothing short of changing the structure of these societies and the value system that supports them can accomplish the goal of equality for the sexes in occupations and in other spheres. Work of all types must be valued and vast difference in compensation for different types of work must be eliminated.

Male and female *occupational* rôles were more or less at parity in many pre-colonial, pre-industrial, pre-capitalist African societies. It has been suggested by this author, as by a number of other writers, that it was the capitalist economic system that accentuated and/or created differentials in income between males and females, and led to the subordination of women's work rôles. It is being suggested that planned change away from the market economic structure and the capitalist ethic can lead to a situation where there is equality of the sexes without identity or interchangeability of the sexes.

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[1] Committee to study the status of women in graduate education and later careers, *The higher, the fewer,* The Graduate School, University of Michigan, 1974.

THE DEVELOPMENT OF EDUCATION: ITS TECHNOLOGICAL AND SOCIAL DIMENSIONS

by Tom Whiston

1. Introduction

The problems, challenges, hopes and fears which are contingent upon the education policy of all nations cannot be divorced from their political, social and economic circumstances. For the majority of nations, in common with defence expenditure and social welfare expenditure, the total education budget comprises a large and growing proportion of total public expenditure, ranging from 15-30 per cent of a government expenditure. Similarly the education-sector is a very labour intensive industry (the United-Kingdom has a work force in excess of 600,000 not including administrative staff).

Now whilst defence expenditure is justified in terms of immediate and ongoing security; and social expenditure in terms of maintenance of the fabric of society; education may be seen as an investment in the future - similarly the interest on that investment may have to wait 20 years, and present education output reflects policies of over two decades ago. We can, therefore, unless we concede an ongoing universal constancy to education programmes, see the great need for education-policy being formulated in the light of careful assessment and discussion of future needs and patterns of change. This rarely occurs, for a variety of political, social and not least institutional reasons[1].

In one sense all public expenditure is concerned with the future maintenance and structure of society, but none is so specifically orientated as the education-budget, however it is within the education sector where we see the major possibility of not only introducing policies which ensure social, economic and political coherence but which also serve to provide a major policy-handle for inducing change or responding to changed (real or perceived) circumstances.

It is a truism to say that the rôle of formal education is to provide society with one of its main means of cultural transmission and of social containment (essentially conservative forces, but also reflecting universal cultural values which over-ride political partisanship), whilst also serving as an important catalytic agent in inducing change, or responding to altered social, technologic and economic needs. This paradox provides an extensive backcloth to much of the discussion of education policy for those nations who are trying to envisage the structure and form of future societies.

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[1] Richmond, W.K. (1966), Educational planning: old and new perspectives, Michael Joseph, London.

On the one hand rear-guard social and political battles are still being fought, whilst future technological structures remain underlineated. It should be remembered that education has both a 'general' and 'special' aim - to nurture personal growth and to provide vocational training (or at least the base for this). But it should also be recognised that these areas are not separate and if economic and social well-being is to be encouraged the interdependencies of these two functions should be very carefully considered. A society where the vocational training is inadequate, or, even worse, inappropriate pays woefully in economic and social terms. Equally, if we get our vocational sights right but fail to produce a system of social coherence and stability, which is far more dependent upon the outlook (and economic circumstances) of individuals then society is still in trouble. The general and specific functions of education should therefore be seen in a symbiotic light - which then carries many major curricula and resource - allocation implications (for instance across social class).

The focus of this discussion paper is to attempt to highlight major policy dilemmas and requirements of two categories of nations (viewed separately here[1]); viz. the developed West and the developing countries; and along two dimensions, technological and social.

Inevitably such a wide remit forces us into rather general statements and superficial treatment of argument, but it is to be hoped that the selection of macro-data and the integrative discussion has some merit of providing a broad perspective which is undoubtedly required, whilst also isolating what are considered to be important issues and points of departure for any assessment of future policies.

Let us briefly review the social and technological circumstances of our two groups of nations: at present the major problem facing Western nations, besides intense political tensions, is one which is contingent upon pre-entry to post-industrial society[2]. This is aggravated by severe inbalance in world trade, by pessimism over future possibilities for economic growth, complicated by energy factors, and unemployment problems amplified due to demographic factors which will go on for another decade or so.

That world demand will not be able to keep pace with significant productivity changes due to technological innovations ('micro-processor revolution', rationalisation procedure, computing techniques, etc.) on the one hand, and that similar considerations and other compounding and multiplier effects may induce a significant degree of structural unemployment may well confront governments in the future with problems of an even more urgent nature than the present time. The ability of the tertiary service sector to absorb shed-labour may also continue to be queried[3] both for technological and economic reasons.

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[1] A second paper - Education and the future: An international context, T.G. Whiston (in preparation) will consider these categories from an integrative viewpoint.

[2] A Bellian view of Post-industrial society has been questioned by several writers (see ref. 2). However there is an undoubted move from the present mechanical to a more automated and computer centered industrial and commercial base.

[3] Gershuny, J. (1978), After industrial society? : The emerging self-service economy, Macmillan, London.

Nevertheless, in social terms, an increasingly 'educationally sophisticated' society (reflecting from previous decades a monotonically increasing participation rate in extended-secondary and tertiary education and also important media effects) may, and is, resulting in important motivation, industrial unrest, participational pressures and socio-economic problems which may again become amplified in the future.

In one sense some of these problems may be seen in terms of a time-lag displacement effect, which reflects a temporial out-of-phaseness between the cumulative output from the education-sector and the vocational demand pattern which is fast changing its profile as crudely illustrated in Figure 1 below. (See Whiston[1] (ii).

Such a mismatch however is to emphasize only the 'special' function of education provision. As mentioned earlier it is critical to also consider the general educative function of education. Unfortunately in many countries these are viewed separately rather than integratively and tend to induce misplaced or unbalanced resource provision encouraging a 'two-culture' society and often insufficient vocational-provision. The alternative of over-directed curricula towards technological elitism will no doubt have to be avoided in the future. (This is highlighted by Husen in relation to future industrialised societies the major problem with which "educational policy makers will have to come to grips - [is] the dilemma of meritocracy versus democracy".

To a certain degree this will be resolved in how we view the relative goals of education - the 'General educative' and 'the specific vocational' and their interdependency.

Richmond[2] in discussing Educational Planning: old and new perspectives considered that resolution of the various camps or arguments to be found in the education field will only be achieved if we can answer the following questions, more or less in order of priority:

(1) How much education does a nation need ?

(2) How much education can a nation afford ?

(3) Do questions 1 and 2 make sense unless we define the meaning of 'education', i.e. stipulate its aims, content and method ?

(4) For example, how is a balance to be struck between the general aim ("the nature of personal growth") and the special aim ("vocational training") ?

(5) How far is it possible to distinguish between education as a consumer good and education as investment ?

(6) If no such distinction can be drawn what sort of returns are we entitled to expect from educational expenditures ?

(7) Does welfare statism imply a measure of uniformity in the educational services ?

(8) Is there a conflict between the idea of excellence and the idea of equality ?

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[1] Whiston, T.G. (1977), Education, Workstyles and social development: A mismatch of abilities, 139th Annual Conference of the British Association of the advancement of science, University of Aston, September 1977.

[2] Richmond, W.K. (1966), op. cit.

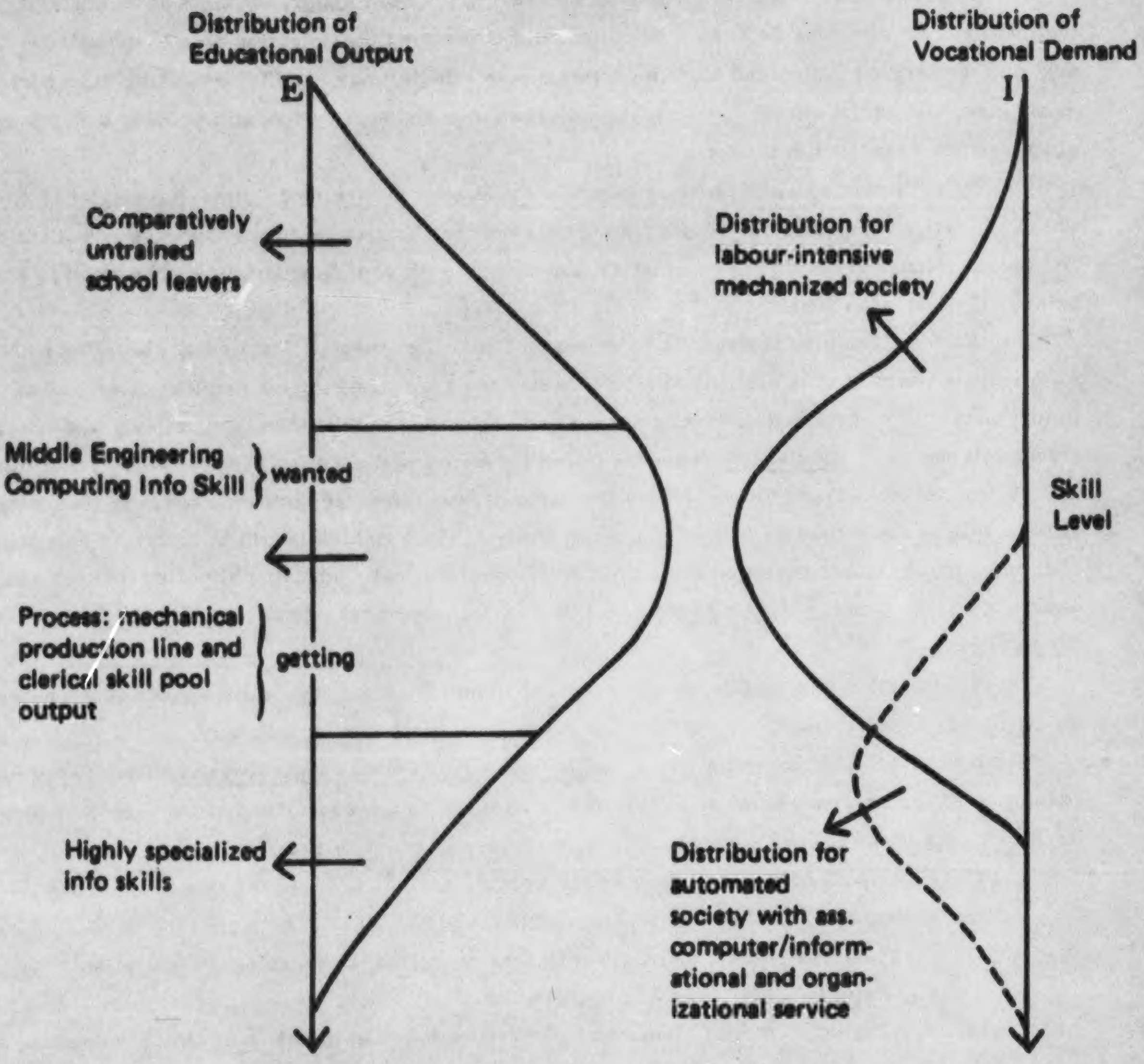
Distribution of Educational Output
E
Comparatively untrained school leavers
Middle Engineering Computing Info Skill
wanted
Process: mechanical production line and clerical skill pool output
getting
Highly specialized info skills
Distribution of Vocational Demand
I
Distribution for labour-intensive mechanized society
Skill Level
Distribution for automated society with ass. computer/informational and organizational service

Figure 1. Temporal mismatch of E, I.

(9) Is State control of education compatible with private enterprise ?

(10) Is total planning possible in a liberal democracy ?

Richmond posed these questions twelve years ago - they are even more urgently in need of answer now.

Answers are not possible, nor possibly even the questions valid, without a functional definition and analysis of differing forms of education and the goals of the educationalist and of a particular society. Many nations equate educational provision with economic improvement - seen in casual terms. Certainly it is extremely difficult to satisfactorily establish this equation. Certain "low resources" countries which have invested in high degrees of education provision have comparatively high per capita incomes[1] but this does not resolve the form and level of provision which dominate the education-policy dilemmas confronting underdeveloped and developing countries. To a certain degree we may perceive in these latter cases two problems here: firstly the great need for literacy programme and universal primary/secondary participation but also a great economic need of vocational training for skills which are optimal to that society. The socio-technical direction and socio-economic policy and goals of developing nations is open to a range of scenarios and discussion: So too for the associated education programmes.

II. Education policy: the developed nations

> "In the conditions of modern life the rule is absolute, the race which does not value trained intelligence is doomed. Not all your heroism, not all your social charm, not all your wit, not all your victories on land or at sea, can move back the finger of fate. Today we maintain ourselves. Tomorrow science will have moved forward yet one more step; and there will be no appeal from the judgement which will then be pronounced on the uneducated.... Alfred North Whitehead"

If one were to consider the pattern of development of educational policy over the past century or so for the majority of developed nations, then it would not be difficult to discern a fairly common movement. No doubt such a pattern, at least in numerical terms, would reveal a monotonically increasing 'education-input' into society as measured by gradual introduction of universal primary and secondary education; increasing participation rates into tertiary education (albeit modified by social class); extension of the total duration (and range) of education programmes for our individual; and, to a certain degree, an homogenisation of the curricula-structure within subject areas and across countries. (The similarities between countries probably outweigh their differences).

Educational economists and manpower-forecasting approaches have inevitably attempted to procure a 'rationalising' effect upon RESOURCE provision - the more so as the cost of national education programmes have come to occupy such a large proportion of public expenditure and as the industrial-educational process has become more intimately linked.

To a certain degree the education sector, like the judiciary, has attempted to resist political interference. However its dependence upon public funding and its supportive rôle to society ultimately make this an impossible, if not nonsensical task. The political 'independence' of educational establishments show considerable variance across nations and defies any simple generalisation.

Education policy and its associated infra-structure is not surprisingly a microcosm of the society in which it is embedded; yet the tautology remains of education on the one hand conforming to societies standards and on the other being a major catalyst towards intellectual and social revolution.

The extent and ways in which a society allows its education sector to be the arbitrator of its own fate, the source of social questioning, a mainspring of social-change, is perhaps a measure of the maturity of that society; to question may be to command.

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[1] Education pays compound interest, Journal of National Education Association, p. 557, November 1958 (cited in Richmond (op. cit.)

However to return to our earlier remarks concerning an historical tradition of increasing educational provision[1] - of universal primary and secondary education; of increasing participation rates in higher education[1] there would now seem to exist a range of economic, social, demographic, technological and industrial factors common to many countries which suggest that there may be future societal discontinuities which may herald important changes in our educational programmes.

This is not to say, however, that irrespective of any major changes in economic or social structure, there has not always been many fundamental social and political arguments as to the social function of education; in many ways 'town and gown' have been historically both friend and foe. Many problems ranging from the ideological nature and function of education; the extent to which children are shaped to conform to social mores or question societal structures; the extent to which the vast majority of individuals, whilst receiving many years of formal education, nevertheless may achieve an intellectual level far short of latent capacity (which may be seen in terms of industrial and commercial demand profiles reflecting many millions of comparatively undemanding occupations) falls in one way or another into this category of discussion.

These difficulties may become even further accentuated in the future. What then might we select as dominant potential developments in which we should embed any debate concerning education policy ? I would emphasize the following:

1. The possibility of limited economic 'growth' for several years
   (Factors concerning energy provision; lack of demand in relation to increased productivity; increasing levels of public expenditure; environmentalism each play a part),
2. The possibility for several Western nations of permanently high levels of structural unemployment
   (Factors dependent upon economic growth; industrial rationalisation procedures; micro; processor influences; each play a part),
3. The possibility of a limit to the drift of labour from primary and secondary manufacturing to tertiary service sector
   (In part due to limits in public spending; lack of real growth; and also rationalisation and technological innovatory developments)
4. Discontinuities in work-style due to extensive micro-processor introduction and auxiliary computing service
   (Whereby previously labour-intensive mechanised procedures move into a fully automated phase),
5. Limits to educational expansion
   (Unless certain unit-cost reduction paths are followed)
   (5b Continuing demographic problems (Whiston 1978c),
6. A social search for labour intensive occupations
   (Both in alternative manufacturing and in public sector)

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[1] Gershuny, J. (1978), op. cit.

(To a certain degree aspects[1] and[2] confound each other and their mutual resolution depends on a range of social policies (see Whiston 1978 a, b).

The consequences of such developments for the education arena are in part as follows:

- Assuming high lines of (permanent) structural unemployment or under-employment, then what rôles are seen for secondary and tertiary education:- the former in terms of curricula and the latter in terms of participation rates and course availability.
- Assuming discontinuities in work styles and the requirement of new skills due to the mechanisation/automation factor - then many training, retraining and course-provision requirements arise.
- Assuming a change in work ethic and attitude to employment, and our concept of 'unemployment', then there may be fundamental shifts in time-use, leisure, continuing education; patterns of activity which require serious educational considerations.
- In recognising the possibility of labour-intensive areas of which many have to be socially engineered outside the manufacturing sector then many possibilities for recognising the educational sector itself as a labour-intensive area, (at present the United Kingdom employ a teaching staff of approximately 600,000 individuals) arise, which may carry not only occupational benefits, but also carry ongoing social and economic benefits in terms of quality of pupil and student output. (See Figure 2 below)

The above brief introduction and notes do not however provide an analytic framework upon which to generate a range of scenarios, possibilities or policy options in relation to future education policy. What follows may be of some limited use in relation to a discussion of future patterns of development, however far more detailed structure on a national basis is required if such a model is to be of any sygnificant use.

The model discusses the relation of skilling levels to industrial developments in the past and considers these in relation to the increasing pattern of educational provision mentioned earlier. It suggests that for many millions of individuals there are two anomalies: - on the one hand they are intellectually underoptimised in relation to latent ability, whilst they are also over-educated with respect to vocational demand. This induces many social, industrial and humanitarian/psychological problems. To a large degree this is a result, it is argued of the introduction of mechanised rather than automated procedures. Naturally such a crude statement has to be modified (and empirically validated) for a range of skill levels and occupational classes.

Similarly the technological developments hinted earlier may herald discontinuities which allow for a range of educational strategies previously unavailable.

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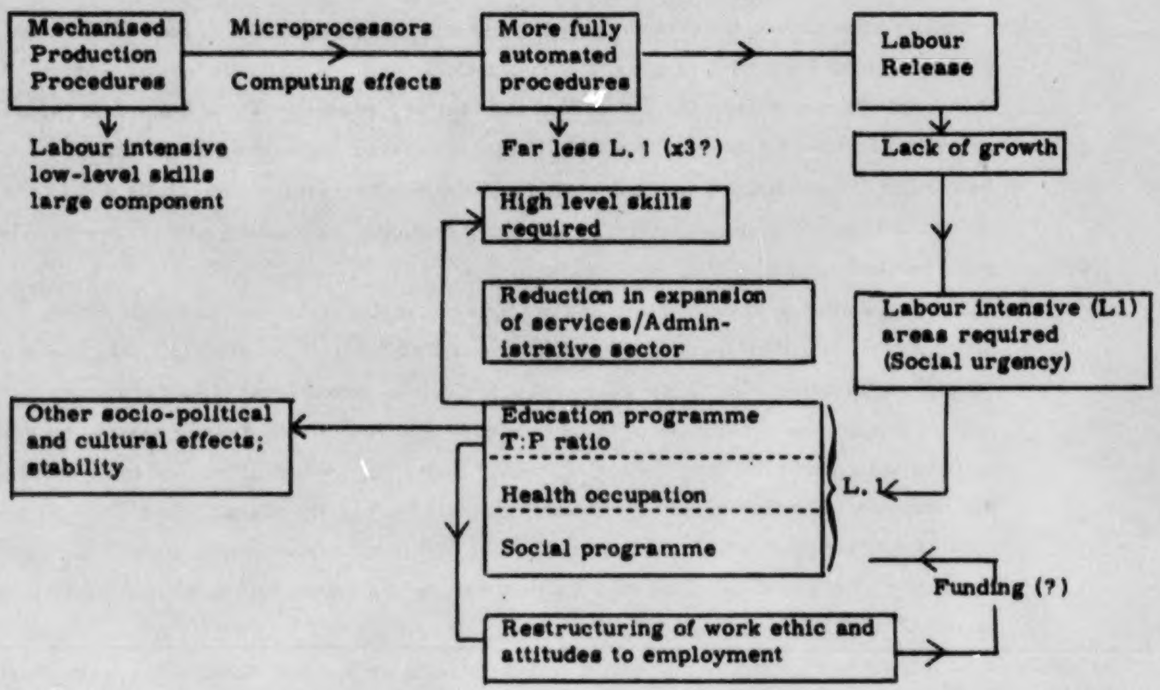
1. Education pays compound interest, Journal of National Education Association, p. 557, November 1958 (cited in Richmond (op. cit.).
2. Whiston, T.G. (1978), Demography and educational policy, Chapter Seven in The uses and abuses of forecasting (ed. T.G. Whiston), Macmillan, London (1978 in press).

Figure 2. Patterns of employment shift in next two decades in relation to education policy


Mechanised Production Procedures
Microprocessors
Computing effects
More fully automated procedures
Labour Release
Labour intensive low-level skills large component
Far less L. I (x3?)
Lack of growth
High level skills required
Reduction in expansion of services/Administrative sector
Labour intensive (LI) areas required (Social urgency)
Other socio-political and cultural effects; stability
Education programme T:P ratio
Health occupation
Social programme
L. I
Funding (?)
Restructuring of work ethic and attitudes to employment

1. Background

An earlier paper[1] discussed the interrelationships between an individual's educative capacity, the educational programmes to which he is subjected at the primary and secondary levels and the work-style which he is likely to embrace for the majority period of his working life.

It was suggested in that paper that though there has been a significant increase in the 'educative input' to western society over the past century or so (at least in quantitative terms) nevertheless there remains a significant gap between the educative potential of most, if not all, individuals and the educative programme in which they are for the most part contained.

It was also suggested that due to the nature of the 'economies of scale' introduced by ever-growing production procedures, the fragmentation of integrated skill-patterns into isolated and subsidiary skill functions (as demonstrated by short-cycle, repetitive and highly standardised operative requirements), together with the introduction of mechanized rather than automated plants - where for reasons of either an economic or social-pressure nature (viz. - actions which are either not economical to automate, or are versatile at a rather trivial level, and also the social unacceptability of massive displacement of labour) - there has been over the past century a significant 'de-skilling' tendency. (This is not to say that the introduction of new technologies has not also generated a significant number of occupations which require the most demanding forms of technical, professional and creative ability. Indeed it would be foolish not to recognise this aspect of the innovatory process. Nevertheless it was argued that for the majority of individuals a de-skilling philosophy was the order of the day).

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[1] Whiston, T.G. (1977), Education, workstyles and social development: A mismatch of abilities, 139th Annual conference of the British Association of the advancement of science, University of Aston, September 1977.

As a consequence of the interaction of these three dimensions (educative potential, education received and occupational style), it was then suggested that a 'mismatch of abilities' resulted which could then lead to a variety of consequencies ranging from individual frustration, through alienation, to macro social disruption, either in terms of labour relations and/or societal malaise. This is summarised in Figure 3, as are the supporting hypotheses of underlying prejudices of the model which is suggested.

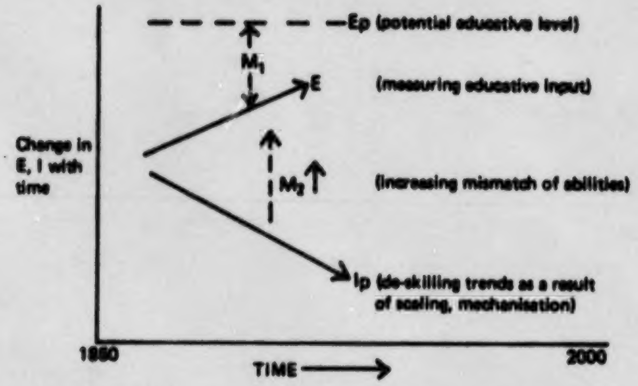
Ep (potential educative level)
M_1
E
(measuring educative input)
Change in E, I with time
M_2
(increasing mismatch of abilities)
Ip (de-skilling trends as a result of scaling, mechanisation)
1950
2000
TIME

Figure 3.

Supporting hypotheses:

1. All people are 'under-educated' - educationally underoptimised (with respect to their innate capacities) the majority excessively so.
2. The majority of individuals are overtrained for the jobs they will later perform.
3. The discrepancy between educative level, cognitive and effective capacity, and industrial requirements reflects gross mismatch in abilities and task requirements.
4. Such a mismatch is increasing - both in quantity (the number of individuals affected) and quality (the extent to which an individual is affected).
5. The mismatch may at some stage induce any or all of the following: Excessive industrial arrest, social instability and significant decrements in the rate of 'technological/industrial progress' albeit modified at an international level by cultural and economic factors.
6. Even in the event of the absence of the significant disruptions itemised (under 5) then such a 'mismatch of abilities' represents great individual and societal loss.

Assuming that the state of affairs could be demonstrated by satisfactory empirical investigation (the previous paper suggested various methodological approaches to the monitoring of the educative and skill level dimensions) then it was also suggested that there are a range of macro policy options which might be considered which might serve to reduce the hypothesised 'mismatch'.

A summary of these options are shown in Figure 4.

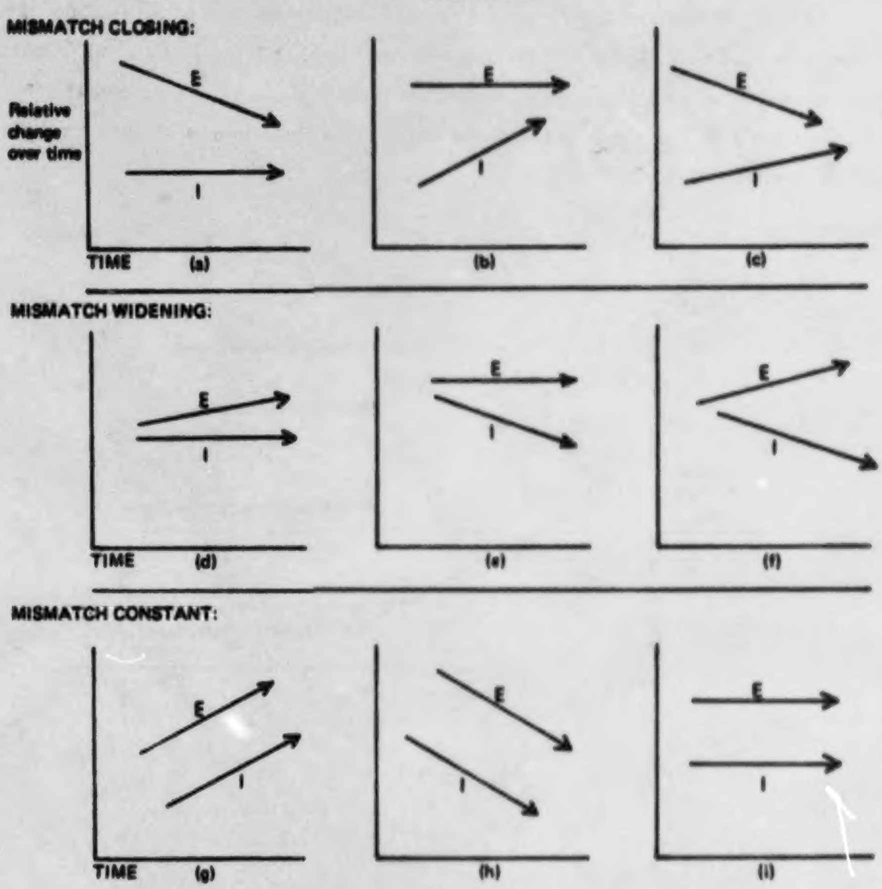

Figure 4. Diagrammatic representation of a variety of policy-options relating to the E. I co-ordinates

Examinations of these options readily indicates that several are unacceptable for a variety of reasons. Or, if not unacceptable to all, would rightly find massive resistance and dissent. Thus those strategies which suggest or require, a diminution of the educative-input to a particular society are surely not acceptable.

Equally a reversal of the I line (i.e. a removal of the hypothesised de-skilling component) might be argued against in terms of economic desirability and/or in numerical employment terms.

Nevertheless it was argued by this writer that strategy (g) was the preferred one from the standpoint of the maximisation of human intellectual and creative capacity. However it was also recognised that there are associated with this strategy several social, employment and economic problems to be solved. Now it is not the purpose of this present short paper to provide any detailed discussion of the creative potential of societies' members, or any distributive characteristic of any such potential, this will be the subject of a much fuller text which is being prepared.

Table 1 below provides some limited commentary on the various 'strategies' of E, I policies available.

Table 1. Educative (E) and Industrial (I) changes and convergence implications

ΔE	ΔI	General comment	Figure No. 4	Convergence Implications
1. $E\downarrow$	I_c	Mismatch closing	a	Reduced educational standards - socially unacceptable
2. E_c	$I\uparrow$		b	Increased skill levels, job involvement (Schumachian)
3. $E\downarrow$	$I\uparrow$		c	Quicker convergence than for (b), but again unacceptable due to reduced educational standard
1. $E\uparrow$	I_c	Mismatch widening	d	Better than present day trends but economic problems ? Acceptable
2. E_c	$I\downarrow$		e	Again better than present day trends but educationally stagnant
3. $E\uparrow$	$I\downarrow$		f	Present scene-range of problems
1. $E\uparrow$	$I\uparrow$	Mismatch maintaining	g	All probably difficult to maintain in any stable sense although (g) has the overall advantage of increasing education level whilst not increasing the mismatch
2. $E\downarrow$	$I\downarrow$		h	
3. E_c	I_c		i	

Tables 2 and 3 shown below, group for comparison purposes the form of strategies relating to (a) the educative parameter as the dominant factor and (b) the industrial parameter as the dominant factor. Each table is provided with some general comments.

Table 2. View of strategies considering E as the dominant factor

Ec	Ec, Ic :	Mismatch maintained		
	Ec, I↑ :	Mismatch closing	→	acceptable ? (1)
	Ec, I↓ :	Mismatch widening		
E	E↑, Ic :	Mismatch widening	→	acceptable ? (2)
	E↑, I↑	Mismatch maintained	→	acceptable ? (3)
	E↑, I↓	Mismatch widening		
E	E↓, Ic	Mismatch closing	→	acceptable ? (4)
	E↓, I↑	Mismatch closing	→	acceptable ? (5)
	E↓, I↓	Mismatch maintained		

General comment

For an Ec policy then there is presumably little change in educational manpower (teachers/admin/building) when normalised with respect to population changes.

For an E ↑ policy then there may be an increase in this educational manpower, together with staffing ratios, improvement in techniques and curriculum design, university/college attendance, duration at school etc.; whilst for E ↓ the converse.

As to the items noted 'acceptable?' above (4) and (5) are rejected due to lowering of educational standards;(1) has the penalty of an educative stagnation leaving strategies (2) and (3) of which (3) is the preferable - especially so if the gradient of I can be improved relative to E.

Table 3. View of strategies considering I as the dominant factor

Ic	Ic	Ec	:	Mismatch maintained
	I	E	↑	Mismatch widening
	I	E	↓	Mismatch closing
I	I ↑	Ec		Mismatch closing
	I ↑	E	↑	Mismatch maintained
	I ↑	E	↓	Mismatch closing
I	I ↓	E c		Mismatch widening
	I ↓	E	↑	Mismatch widening
	I ↓	E	↓	Mismatch maintained

General comment

Again the acceptability pattern is as referred to in Table 2 above.) The only point of arranging the pattern in this form, is that if, as is argued by some authorities, the educative purse is provided by the industrial index (which is not necessarily so by any means) then we can observe from this Table the possible options which relate to three patterns of industrialisation.

Integration of assessment

Obviously each of the strategies referred to above carry a wide range of educational, industrial, economic, social, political and cultural implications which are worthy of a much more extensive discussion than can be provided in this present note. There exists a massive literature pertaining to each separately and to a certain degree at an interactive level.

Such sources as Schumaker[1], Friedman[2], Freud[3], Vickers[4], Dore[5], Roszak[6], Harbison[7], Illich[8], Marcuse[9], Marx[10], Blauner[11], Husen[12], Young[13] are particularly relevant and the writings of each of these authors could be placed in the context of the various strategies which have been referred to in so minimal and sterile a fashion here.

The literature and political debate which relates to economic and social goals, in particular that which pertains to the grammar school/comprehensive debate (in the United-Kingdom) on the one hand and to economic growth/alternative structures on the other, finds an immediate place in the debate concerning future patterns of development for the E, I parameters (in the United-Kingdom).

Similarly present legislation (or non-legislation) concerned with so-called Industrial Democracy or Participation literature[14, 15] plays an important rôle in the interactive containment

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1. Schumacher, E.F. (1975), Small is beautiful, Blond and Briggs, London, 1973.
2. Friedmann, G. (1964), Chapter 25 in Friedmann, G. and Neville, P. (eds) Traité de sociologie du travail, Librairie Colin, Paris, Revised Ed., vol. III.
3. Freud, S. (1930), Civilization and its discontents, Hogarth Press, London.
4. Vickers, G. (1970), Freedom in a rocking boat, Pelican, Harmondsworth.
5. Dore, R. (1976), The diploma disease: Education, qualification and development, Unwin, London.
6. Roszak, T. (1970), The making of a counter culture, Faber and Faber, London.
7. Harbison, F. and Myers, C. (1964), Education, manpower and economic growth; strategies of human resource development, McGraw-Hill, New York, 1964, p. 45-48.
8. Illich, I.D., Energy and equity (1974), Calder and Boyers, London.
9. Marcuse, H. (1964), One dimensional man, Routledge and Kegan Paul, London.
10. Marx, K., Selected writings in sociology and social philosophy - Bottomore, T.B. and Rubel, M. (1956) (eds.), Part 1, Watts, London.
11. Blauner, R. Alienation and freedom: the factory worker and his industry, The University of Chicago Press, 1964.
12. Husén, T., Talent, equality and meritocracy, (Project 1 - Educating Man for the 21st century), Martinas Nijhoff, The Hague, 1974.
13. Young, M. (1958), The rise of the meritocracy, Pelican, Harmondsworth.
14. Report of the Committee of inquiry on industrial democracy, H.M.S.O. 1977, Cmnd 6706.
15. Pateman, C. (1970), Participation and democratic theory, Cambridge U.P.

of the two parameters E and I. For in the same way that job enlargement, job diversification and job enrichment literature (see, for instance, the Volvo Report[16] has played a part in attempting to close the gap, probably unsuccessfully[1], between ability and performance criteria, so too the wider implications of the industrial participation moves must be considered.

It is important, of course, to recognize the distinction (which may in itself reflect a major problem or fundamental schism - in society inherent in such a distinction) of the dual nature of educative programmes - the humanistic/liberal and the vocational. Such a distinction is very dangerous however, if one forgets that the former, which is essentially cultural, will set the bounds and expectancies of an individual - with respect to the latter, his occupational involvement. The two aspects are not independent - though in many ways behave as if they are.

Similarly one must accommodate the highly simplistic interpretation which I have so far suggested, with the wide range of educative-input which individuals receive and the variable demands of occupations which they take up.

This aspect is summarised in Figure 5 below. This is not to say, however, that because there is a distribution of talents, motivation and opportunities that an optimal mix is achieved - obviously much depends upon the nature of the respective distribution curves.

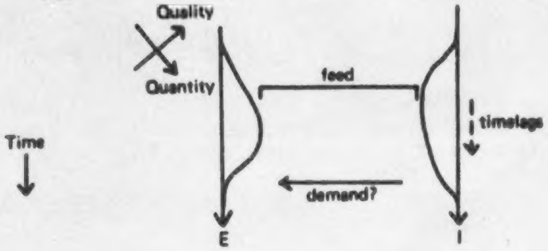

Figure 5.

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[16] The Volvo Kalmar Plant: The impact of new design on work organization, Agarén, S., Hansson, R., and Karlsson, K., The Rationalization Council, SAF LO Stockholm, 1976.

[1] The Volvo Kalmar plant is a very good example of a worthwhile attempt to introduce more humane and challenging working conditions. The introduction of such a plant was partly motivated by consideration which related to absenteeism and labour turnover which affect productivity.

Yet in a report on the plant, Agarén, S., Hansson, R., and Karlsson, K. state :

> "Absenteeism for workers at the Kalmar plant during the first half of 1976 was 14 per cent. During the same period, absenteeism among workers with similar jobs in the conventional plant at Torslanda (at Gothenburg) was 19.2 per cent. Personnel turnover for similar employee categories during this period was 16.3 per cent at Kalmar and 20.8 per cent at Torslanda. It is difficult to relate the differences in production systems to the differences in absenteeism and turnover. These figures are obviously influenced by other factors, such as the labour market situation in the different regions."

These figures are not as dramatic as one might expect or have hoped for.

To which we may add a list of qualifications or enquiries, for instance:

(a) The nature of the 'dialogue' between the educative parameter and the industrial requirements - is the former rôle to feed the latter, or does the latter dominate in defining E's rôle ? What are the trends over time ?

(b) What is the form of changing the profiles of E, I with time - and associated with this the effect of institutional time-lags, varying lead-times, lack of correspondence, etc ?

(c) A wide range of qualitative problems relating to appropriate degrees of training and occupational definition.

(d) The social limits to deskilling as a function of innovatory and process developments, seen against an increasing educational input.

The causes of industrial unrest have of course been attributed to a complex web of events and forces. The Marxist will talk of alienation, the psychologist of job satisfaction and self-actualisation, the economist of monetary rewards, and so on. Possibly all factors contribute to the final pattern of disruption which determines productivity and survival. In many ways the physical working conditions of employees has improved immeasurably - the effects of legislation factory acts, introduction of machinery to overcome undue physical labour, ergonomic factors, job enlargement and enrichment etc. - the list is a long one. But superimposed upon these trends are the inevitable consequences of 'rationalisation of the work process'; standardisation, repetition, time cycle reduction - in short narrowing of skill. At this point we exchange a *physical stress* for a *perceptual stress*, and it is this later mental component which is more likely to induce either individual mental-stress problems or more organized resistance.

Ultimately this may be shown in reduced productivity, displaced initiative and *reduction in the rates of growth of technological development*.

At the level of international competition it becomes important to unravel differing scales of social and economic development whereby the extent to which work-forces accept or comply to similar conditions will vary. The extent to which the socio-economic and cultural *differences* outweigh the similarity of *needs*, of say a Japanese, British, German, Iranian and Argentinian worker is not yet fully explored. The balance of differences and 'perceived needs' may well determine their relative rates of industrial progress. This is not to say that many other technological, manpower, economic and social factors do not play a dominant rôle with respect to industrial progress - but the form of that progress will be shaped by the educative backcloth of the populace.

This immediately raises the question as to whether it is possible to derive some form of 'educational index' of a country. There have been attempts - and a typical example is that of Harbison and Myers[1] who have attempted to calculate such an index for seventy-five countries and related this to level of economic development. The table over the page reproduces some of their data for the 1950s.

It would be interesting to plot the data over a time series in order to map the E co-ordinate referred to in this present paper. (Their measure consisted of 'arithmetic total of (a) enrolment at the level of secondary education as a percentage of the age-group 15-19 and (b) enrolment at the

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[1] Harbizon, F. and Myers, C., *op.cit.*

Table 4. Four levels of educational development in the 1950s

Seventy-five countries ranked according to the educational index of Harbison and Myers[1]

Level I Under-developed		Level II partially Developed		Level III Semi-advanced		Level IV Advanced	
Sudan	7.5	Iraq	31.2	Norway	73.8	U.S.A.	261.3
Uganda	5.5	Peru	30.2	Uruguay	69.8	New Zealand	147.3
Senegal	5.5	Turkey	27.2	Czechoslovakia	68.9	Australia	137.7
Haiti	5.3	Jamaica	26.8	Poland	66.5	Netherlands	133.7
Nigeria	5.0	Pakistan	25.2	Yugoslavia	60.3	Belgium	123.6
Kenya	4.7	Ecuador	24.4	Italy	56.8	United Kingdom	121.6
Liberia	4.1	Lebanon	24.3	South Korea	55.0	Japan	111.4
Congo	3.6	Malaysia	23.6	Hungary	53.9	France	107.8
N. Rhodesia	2.9	Ghana	23.2	Chile	51.2	Canada	101.6
Ivory Coast	2.6	Paraguay	22.7	Greece	48.5	USSR	92.9
Tanganyika	2.2	Colombia	22.6	Taiwan	48.4	Finland	88.7
Saudi Arabia	1.9	Brazil	20.9	Venezuela	47.7	West Germany	85.8
Afghanistan	1.9	China (m/land)	19.5	Costa Rica	47.3	Israel	84.9
Somalia	1.6	Iran	17.3	Portugal	40.8	Argentina	82.0
Nyasaland	1.2	Tunisia	15.2	Egypt	40.1	Sweden	79.2
Ethiopia	.7	Bolivia	14.8	South Africa	40.0	Denmark	77.1
Niger	.3	Dominican Republic	14.5	Spain	39.6		
		Burma	14.2	Cuba	35.5		
		Libya	10.8	India	35.2		
		Indonesia	10.7	Thailand	35.1		
		Guatemala	10.7	Mexico	33.0		

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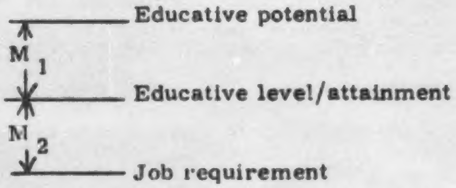
[1] Adapted from Frederick Harbison and Charles A. Myers, Education, manpower and economic growth; Strategies of human resource development, McGraw-Hill, New York, 1964, pp. 45-48.

level of higher education as a percentage of the age-group 20-24 (multiplied by a factor of 5 because of the greater importance of higher education on modernisation').

Finally, it must be remembered that the 'mismatch of abilities' is twofold in direction and content. For on the one hand there is a mismatch from 'above' and the other from 'below'.



To a certain degree it is perhaps impossible to totally irradicate M_2 - and there are those who would consider that there are certain benefits in 'mentally turning off for a while and undergoing the recuperative cure of a few hours rest from mental turmoil' - the question arises however as to how many hours and how many years ? With respect to the mismatch M_1, however, then to close mental horizons as we do, to fail to build upon the wonderful intellectual creative ability of almost all individuals, to fail to maintain what is in the developing child (as opposed to instil) is nothing short of criminal. The loss to the individual and to society is incalculable. Indeed the ensuing frustration, aggression and social disruption which often follows costs society dearly.

At the end of the day, however, we are left with a rather thorny problem. For if we significantly restructure our educative empires to more successfully approach the limits of human potential, presumably a desirable aim, then at the same time we increase what I have called the 'mismatch of abilities' for a wide segment of the population. Equally if we restructure our industry towards a form which is better suited to human creativity and versatility then we may lose the economic base which provides for our educational structure in its present conceived form. There remain, however, fundamental alternatives to our present educational structure - alternatives which may much more fully explore individual tutoring, severe reduction in class size, increased parental involvement - which might be achieved through a radical restructuring of our work base. Our present structure of three men doing a five-day week might (and indeed has) been replaced by five men doing a three-day. If productivity is maintained - and spending during the extra 'leisure periods' contained - then a wide range of alternative social, industrial and educative structures open up.

Systems overview

Given below are three figures which when combined attempt to provide a gestalt or overview of industrial, workstyle, educational and social developments over the last century. Such an attempt is patently inadequate but it is felt that such an overview is necessary in order to try and capture the social forces at work. Its ultimate goal is to identify a compatible industrial and educational orientation which recognises and reduces the conflicts in industrial society - it aims at a symbiotic relationship rather than a dependency.

Figure 6 provides a crude mapping of future industrial trends (a) internally to the United Kingdom and (b) in relation to the competitive world market. It is extremely gross and many modifications would have to be made for individual industrial sectors. (e.g. chemical industry, car manufacturing, electronics, textiles, banking). What it indicates is that in attempting to solve an international industrial conflict, we induce an internal social conflict - capital intensive philosophies inducing unemployment, labour intensive approaches being uncompetitive - although this is open to debate. If in the first case the shed labour is socially directed in an acceptable manner then problems are reduced; with the second strategy competitiveness depends on the level of the wage economy, with many lifestyle implications and perceptual problems. Each strategy carries educational implications. (Manpower levels required; social awareness introduced).

Figure 6.

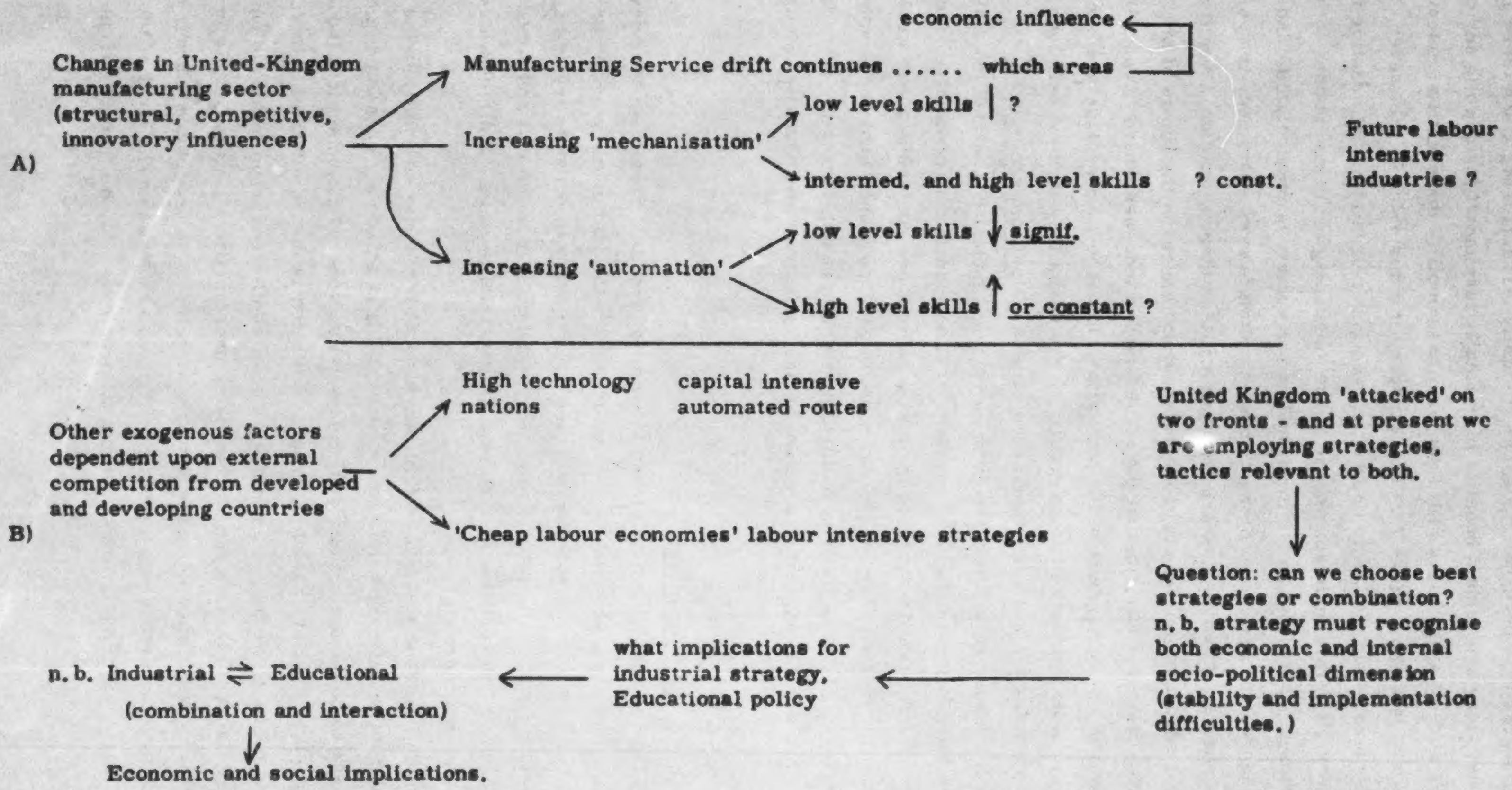

A)
Changes in United-Kingdom manufacturing sector (structural, competitive, innovatory influences)
Manufacturing Service drift continues ...... which areas
economic influence
Increasing 'mechanisation'
low level skills | ?
intermed. and high level skills ? const.
Increasing 'automation'
low level skills ↓ signif.
high level skills ↑ or constant ?
Future labour intensive industries ?
B)
Other exogenous factors dependent upon external competition from developed and developing countries
High technology nations
capital intensive automated routes
'Cheap labour economies' labour intensive strategies
United Kingdom 'attacked' on two fronts - and at present we are employing strategies, tactics relevant to both.
Question: can we choose best strategies or combination? n.b. strategy must recognise both economic and internal socio-political dimension (stability and implementation difficulties.)
what implications for industrial strategy, Educational policy
n.b. Industrial ⇌ Educational
(combination and interaction)
Economic and social implications.

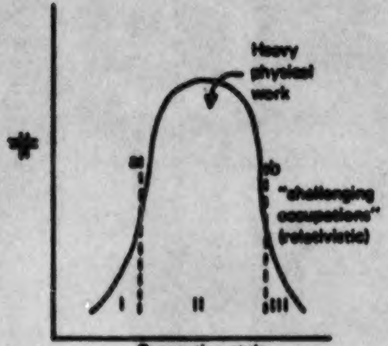
Figure 7 outlines educational developments over the last century in relation to the industrial profile. However it emphasises the emerging or dominant social profile which is seen, ultimately, as more relevant in shaping political and cultural structure and thus economic performance. (It would be interesting to carry out comparative mapping for the USA, USSR, Germany and Japanese cultures.)

Figure 8 summarises the interaction of educational and industrial developments from which we might suggest that the main emerging concept is the increasing 'mismatch' of education and workstyle, of expectancy and actuality in lifestyle for Group II who form the majority of the manufacturing workforce. (mismatch $E > I_a$ - education backloth greater than jobstyle demands).

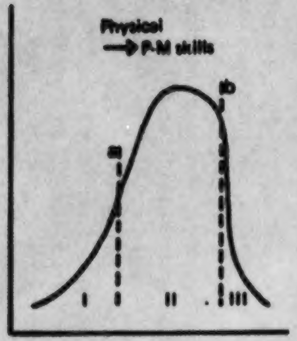
If we accept this concept then a movement of mechanisation to automation coupled with a significantly upgraded and restyled educational input - in particular at the secondary level (and primary) may be appropriate in coming to terms with social tension, with future work structures and in redirection of manpower into significantly different occupation structures - in particular in social areas of the tertiary sector.

Figure 7. Educational developments over the last century and relation to industrial scene

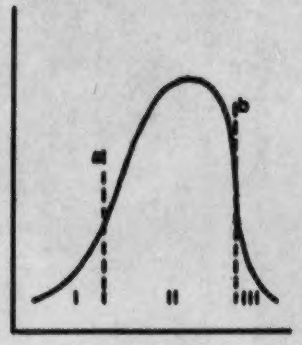
1860-1920	1920-50s	1950-70s	1980 ? (approx time-period)
low participation rate in cumul. sense elitist or selective tertiary level (meritocratic? egalitarian?)	increasing partic. rate at secondary level still high cultural select. factor at tertiary level	partic. rate maximising expanding tertiary level selection rules more meritoc. than egal.	p. r. max but input changes tertiary continues to expand but profile and structural changes. selectivity barriers dropped even more
Labor intensive industry, large manual component	Increasing mechanisation (but with maintenance of workforce.)	More sophisticated mechanisation, partial automation introduced. Much clerical, data handling labour beginning to be shed.	Mech. - Autom. increasing data autom. increasing (re-emergence of small enterp. craft skills ? Educ. industry as a labour intensive area ?)
Increasing literacy (but media dominance effects - homogenisation and polarisation) Increasing social awareness, questioning social and technol. change, pressures for participation (decline in patronising rôle, paternalistic elements. (see USA v United Kingdom) Increasing time spent in Educ. system (approach 25-30 % of life span) (+ TV - 50 %) Increasing econ. expectation (Hirschian positional goods): industrial workstyle expectation ? (expectancy actuality - frustration, dissaffection)			
two cultures in econ. social terms Employment, Educ. implications - see figure 8		two cultures in job style terms inform. underload-production line) inform. overload - profess.)	two ? (age effects ?) critical mass reached conflict (expectation, lifestyle.)



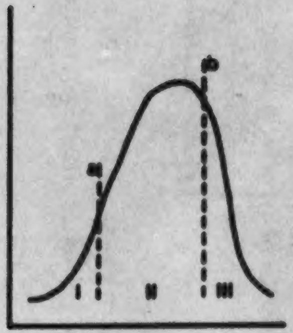
Occupation style
1880-1920



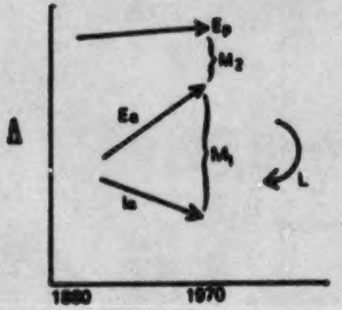
1920s-50s



1950s-70s



1970s-?



(a) But as related to groups I, II, III differing effects:

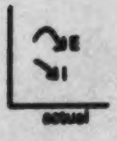
For Group I E I - but still unemployable
II E I - gap widening with each decade
III E possibly I as systems complexity recognised (see also obsol. rate of skills)

} as viewed from industrial standpoint but not 'social' view. E still requires upgrading.

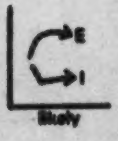
(b) In terms of threshold shift (a, b) - function of critical changes in technology - discontinuities.

Thus (a) moving L R i.e. more unemployable due to age effects, and upgrading of tasks from physical to perceptual-motor tasks. (p.m).

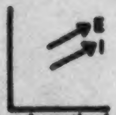
(b) moving R L



actual



likely



schematized

Concluding comments

Education policy responses must be seen in terms of some of the factors briefly outlined in section (II. 1) which suggested that there may be a long if not permanent period of structural unemployment, (demographic factors play an important rôle) and that technological innovation may induce severe discontinuities in work-style. Similarly our thinking in relation to education should be influenced in part by some of the 'mismatch' factors described in section (II).

Many issues surround these difficulties: the extent to which education is 'socially-expanded'; the dangers of technocratic elitism; the frustration of unemployed graduates with irrelevant specialist skills; the frustration of alienated work forces.

We may not be moving towards a Post industrial society in the terms so clearly denunciated by Bell and others - nevertheless we may be faced with its problems.

Husén[1] recognises these problems thus:

> "The horizon of the post-industrial society and educational policy makers will have to come to grips - is the dilemma of meritocracy versus democracy. The problem can be described by stating a series of antitheses. We have on the one hand the trend toward cognitive competence becoming the 'power basis', and on the other the quest for greater equality of life chances, coping power and participation. We have on the one hand the classical liberal conception of equality which entails a belief in careers being open to talent on the basis of fair competition, and on the other the radical democratic conception according to which the distribution of abilities is an arbitrary outcome of the 'natural lottery'.
>
> We have on the one hand the strongly felt need to improve educational opportunities for those classes who have until now been underprivileged, and on the other the immediate demands for highly trained technological and managerial manpower. We have on the one hand a strong popular demand for an 'open door' policy in higher education, and on the other hand an often dominant element of competitiveness. We have on the one hand the 'corrective' type of egalitarianism, according to which society should confine itself to correcting for certain differences in starting chances, such as putting all the competitors on scratch and then leaving it to individual initiative to take advantage of the equal opportunity provided; on the other there is the 'redemptive' egalitarianism which emphasizes equality of results and is ready to distribute opportunities in a compensatory way. Evidently, the resolution of this dilemma is a matter of value priorities. The goal of economic growth is inextricably linker to the creation of competencies conducive to meritocracy. The goal of redemptive equality can be achieved only by playing down the rewards, status and authority connected with superior competence."

III. Some comments in relation to 'developing' nations

In considering the developing of underdeveloped countries we are confronted with a somewhat different range of problems, though the need for education is of course universal. The problems relate by varying degrees to levels of economic development, form of industrial infra-structure, physical deprivation and a variety of political structures and socio-cultural backcloths which hinder any sensible generalization.

Nevertheless we might immediately summarize by saying that severe economic problems confront these societies in part due to mounting demographic pressures; partially initiated educational programmes which though well entrenched nevertheless require extensive expansion if they are to keep pace with increasing demand (whilst also competing with other important budgetary sectors for public funds); sluggish economic growth for a variety of internal and exogenous factors; massive socio-cultural traditions reaching over many centuries which play an important and understandable resistance to the grafting or imposition of what might be sometimes described as western paternalistic thinking.

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[1] Husen, T., op. cit.

The major dilemma confronting many of the societies and ultimately filtering into many social provision systems - including the education sector - is the competing forces of short term amelioration of problems versus long-term planning and investment, and in which the age-cohort distribution plays such a dramatic part.

Thus on the one hand there is often a wide range of social and economic deprivation resulting in urgent immediate pressure for resource provision - viz. for an 'immediate basic needs' economy; however on the other hand there is an equally great need for various forms of socio-technical development if there is to be continuing improvement.

(In educational terms this may be reflected in policy dilemmas as to the ratio of primary: tertiary investment). However the form, strategy and level of optimal technological development within a world competitive market present many problems - including manpower provision.

It is possible that with sufficient investment, co-ordination and consistent fortitude (possibly along NIEO lines) then such economies may obtain economic independence and social well-being. Educational policy has to be carefully interwoven into such a framework for expansion and change.

To a lesser or greater degree the educational infra-structure of these countries whilst occupying an increasing proportion of GNP as shown in Tables 5 and 6 below, nevertheless is required not only to 'expand' but to be more fully developed and or constructed.

Table 5. Average annual increase of total and recurring public expenditure on education, 1960-1965, by continental region (%)

	Total expenditure		Recurring expenditure	
Continental region	Increase (%)	Number of countries	Increase (%)	Number of countries
All countries	14.2	72	13.4	72
Africa	13.5	14	16.0	17
America, North	11.4	10	11.5	7
America, South	18.5	4	21.9	4
Asia	14.8	20	13.1	21
Europe (Inc. USSR)	14.9	22	13.6	21
Oceania	11.4	2	11.6	2

Table 6. Public expenditure on education as a percentage of total public expenditure (budget) 1960 and 1965

Continental region	1960 Budget (%)	1960 Number of countries[1]	1965 Budget (%)	1965 Number of countries[1]
Africa	14.5	23	16.4	36
America, North	15.6	10	17.6	10
America, South	12.6	7	15.4	10
Asia	11.8	17	13.2	28
Europe (Inc. USSR)	13.5	13	15.0	23
Oceania	10.4	4	15.7	10
World	13.5	74	15.5	125
Selected developed countries[2]	13.6	15	15.9	15
Selected developing countries[3]	13.2	30	15.5	30

1. Including non-governing territories.

2. Countries with GNP per capita above $10,000 (around 1965).

3. Countries with GNP per capita below $300 (around 1965).

Source: Ref. (World Survey of education, Unesco V 1971 Paris (pp. 66, 78)

The pattern of public expenditure on education since 1965 is shown in Table 7 below where it can be seen that many developing countries have increased their public expenditure on education for the period 1965-1973 in excess of the world annual average increase of 12.8 per cent. Despite the increases observed there still remains however an urgent need to both increase the social catchment area and to ensure a less precipitous drop-out or wastage rate.

Table 7. Estimated public expenditure on education in U.S. dollars[3]

Continents, major areas and groups of countries[1]	Public expenditure on education, in dollars (in millions)			Annual average increase: Public expenditure on education	Annual average increase: Gross national product	Public expenditure on education as percentage of GNP			Public expenditure on education, per inhabitant		
	1965	1970	1973	1965-1973	1965-1973	1965	1970	1973	1965	1970	1973
				%	%						
World total[2]	103 160	170 685	270 295	12.8	10.9	4.9	5.4	5.6	40.3	60.1	89.6
Africa	1 680	3 005	4 695	13.7	10.9	3.6	4.2	4.2	5.5	8.7	12.6
America	43 060	77 210	105 340	11.8	8.6	5.0	6.3	6.4	93.6	151.1	193.3
Asia	7 480	12 800	25 810	16.7	15.7	3.7	3.6	4.0	6.8	10.1	19.0
Europe	34 300	53 660	95 980	13.7	12.0	4.5	4.8	5.1	75.4	116.1	203.3
Oceania	1 060	1 990	4 440	19.6	14.4	3.6	4.5	5.2	60.5	102.7	215.5
USSR	15 580	22 020	34 030	10.3	9.7	7.2	6.8	7.5	67.4	90.6	136.1
Developed countries	95 025	157 955	249 105	12.8	11.0	5.1	5.7	5.8	92.8	146.7	225.3
Developing countries[2]	8 135	12 730	21 190	12.7	10.4	3.2	3.5	3.8	5.3	7.2	11.1
Africa (excluding Arab States)	1 080	1 870	2 905	13.2	11.2	3.2	3.7	3.6	4.7	7.2	10.3
Northern America	39 740	71 530	96 200	11.7	8.3	5.3	6.7	6.8	185.4	314.3	413.5
Latin America	3 320	5 680	9 140	13.5	10.4	3.0	3.6	3.8	13.5	20.1	29.3
Asia (excluding Arab States)[2]	7 100	12 210	24 310	16.6	15.7	3.7	3.6	3.9	3.9	6.0	11.2
Arab States	980	1 725	3 290	16.3	15.7	4.2	4.9	5.4	9.3	14.0	24.6

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[1] For composition of major areas and groups of countries, see footnote 1, Table 1.2.

[2] Not including People's Republic of China, Democratic People's Republic of Korea and Democratic Republic of Viet-Nam.

[3] Statistical Yearbook, Unesco, Paris, 1976.

In 1968 the percentage of children of primary and secondary school age attending school at any level is indicated in Figure 9 below.

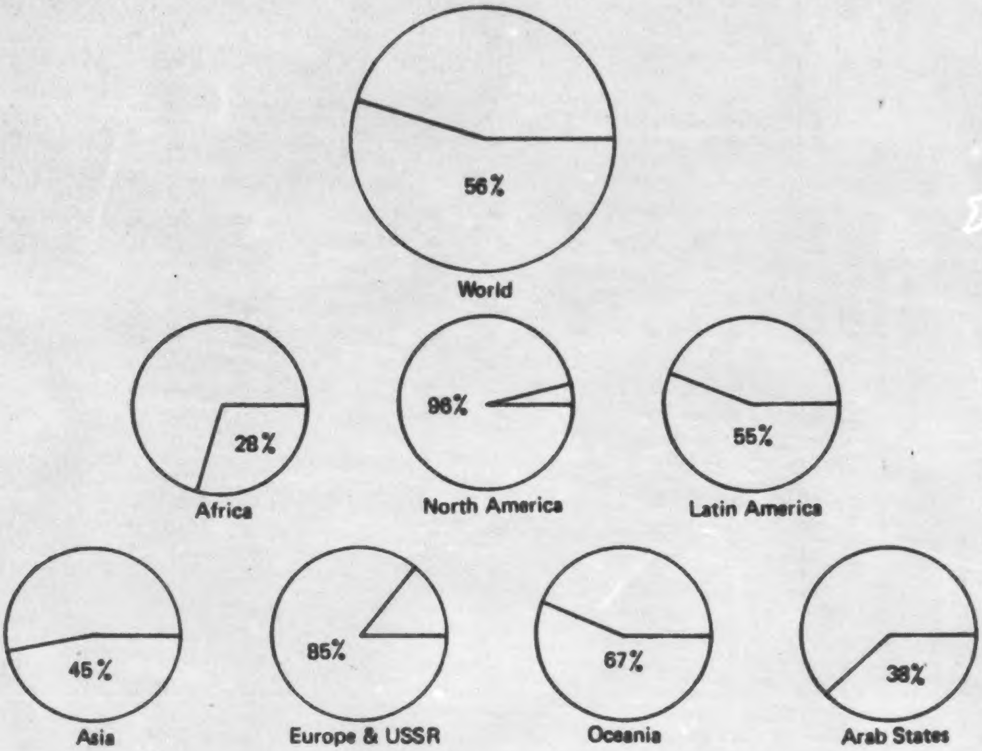

Figure 9. Percentage of children of primary and secondary school age (combined) attending school at any level : 1967-68

By 1975 the progress towards universal primary education for populous developing countries is given in Tables 8 and 9 below.

Table 8. Gross enrolment ratios for primary education according to national and standardized structures. Both sexes

Country	Number of grades	Official age-group	Gross enrolment ratio national structure[1]			Gross enrolment ratio standardized structure[2]		
			1965	1975	1985	1965	1975	1985
	1	2	3	4	5	6	7	8
India	5	5-9	74	77	80	65	66	69
Indonesia	6	6-11	69	81	92	69	81	92
Brazil	8	7-14	67	91	106	84	116	134
Bangladesh	5	5-9	49	73	80	44	63	71
Pakistan	5	5-9	40	51	59	35	45	52
Nigeria	6	6-11	37	50	65	37	50	65
Mexico	6	6-11	92	113	118	92	113	118
Philippines	6	7-12	113	105	109	109	101	107
Thailand	7	7-13	78	84	87	86	93	97
Turkey	5	7-11	110	108	116	84	89	95
Egypt	6	6-11	75	72	77	75	72	77
Korea	6	6-11	101	109	109	101	109	109
Iran	6	6-11	61	78	92	61	78	92
Burma	5	6-10	73	90	99	61	76	84
Ethiopia	6	7-12	11	25	45	11	23	42
Colombia	5	7-11	85	107	124	69	88	102
South Africa	7	6-12	94	116	125	108	133	144
Zaire	6	6-11	70	95	109	70	95	109

1. These ratios were obtained by dividing the total enrolment in primary education by the population of the age-group given in Column 2.
2. These ratios were obtained by dividing the total enrolment in primary education by the population aged 6-11 years.

Source: Unesco (1977). Trends and projections of enrolment by level of education and by age. (Division of statistics on education, Office of statistics), Unesco, september 1977.

Table 9 below is reproduced from the Unesco study concerned with Trends and projections of enrolment. The table suggests that a drift towards the tertiary level is occurring to some extent (see later in this section and also 330-331 and page 354-355 for comments on binary education strategies for LDC's viz whether emphasis is placed at primary and/or tertiary level). However it should be noted that differences in education structure - a major determinent of these regional differences: e.g. the short duration of primary education in South Asia when compared with Latin America or Africa. The pattern that might be expected up until 1985 is shown in Table 10.

Table 9. Percentage distribution of total enrolment by level of education

Region	1965			1985		
	1st level	2nd level	3rd level	1st level	2nd level	3rd level
M D R	63.1	30.0	6.9	54.1	33.5	12.4
L D R	80.3	18.1	1.6	72.5	24.0	3.5
Africa	88.3	10.2	1.0	79.9	17.9	2.2
Latin America	85.5	12.3	2.2	73.7	19.5	6.8
South Asia	76.4	21.8	1.8	70.0	27.2	2.8

Table 10. Enrolment ratios for the age-group 6-11 years and gross enrolment ratios for primary education. Both sexes

	Age-group 6-11 years			Gross enrolment ratio		
	1965	1975	1985	1965	1975	1985
L D R	54	62	68	66	76	84
Africa	40	51	61	54	69	82
Latin America	65	78	86	90	111	121
East Asia	97	99	100	101	103	103
South Asia	56	61	66	64	69	75
25 LDC	19	28	39	27	37	52
Sahel countries	16	17	19	22	27	56

Source: Unesco 1977.

However as hinted earlier it is also important to consider the profile of the drop-out rate which can, for differing socio-economic and cultural groups, make severe in-roads into any gains made. Table 11 below gives some indication of the survival rates for various regions.

Table 11. Approximate education survival rates for the 1965 and 1970 cohorts. Both sexes

		Percentage of enrolment in Grade 1 reaching :				
Region	Year	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
L D R[1]	1965	100	67	58	50	41
	1970	100	70	61	54	45
Africa[1]	1965	100	78	71	61	52
	1970	100	83	78	72	64
Latin America	1965	100	58	48	44	33
	1970	100	64	54	47	41
South Asia	1965	100	67	58	49	40
	1970	100	69	60	52	41

[1] Excluding South Africa.

Source: Unesco 1977.

Similarly, immense problems of illiteracy still remain despite noble ancilliary programmes made after the 1965 Teheran Conference on the eradication of illiteracy. (See Tables 12 and 13 and Figure 10.

Table 12. Adult literacy (both sexes) around 1960 and 1970 (in thousands)

	Around 1960				Around 1970			
Major region	Adult population 15 years old and over	Literate adults	Illiterate adults	Illiteracy	Adult population 15 years old and over	Literate adults	Illiterate adults	Illiteracy
				%				%
Africa	153 000	29 000	124 000	81.0	194 000	51 100	143 000	(73.7)
Northern America	137 000	133 000	3 300	2.4	161 000	158 000	2 500	1.5
Latin America	123 000	83 100	40 000	32.5	163 000	125 000	38 600	23.6
Asia - 1	982 000	440 000	542 000	55.2	1 237 000	658 000	579 000	46.8
Europe and USSR	464 000	439 000	24 500	5.3	521 000	502 000	18 700	3.6
Oceania	10 600	9 400	1 200	11.5	13 000	11 800	1 400	10.3
(Arab States)	(52 700)	(9 900)	(42 700)	(81.1)	(68 300)	(18 400)	(49 900)	(73.0)
World Total[1]	1 870 000	1 134 000	735 000	39.3	2 287 000	1 504 000	783 000	34.2

1. Not including China (mainland), Democratic People's Republic of Korea and Democratic Republic of Viet-Nam.

Source: Educational trends in 1970: an international survey - International Bureau of education, Unesco: IBE Paris-Geneva 1970.

Table 13. National means for reading test and subtests expressed in uniform standard score units. Population IV

	Reading comprehension					
Country	Total	Type B	Type C	Type D	Type E	Word knowledge
Belgium (FL)	- 1	1	1	- 7	- 2	3
Belgium (FR)	2	0	- 1	2	0	11
Chile	- 13	- 9	- 15	- 10	- 5	- 3
England	10	10	10	10	- 4	0
Finland	6	8	5	6	- 6	- 14
Hungary	- 3	0	1	- 2	4	14
India	- 30	- 26	- 32	- 23	- 21	- 24
Iran	- 28	- 30	- 32	- 23	- 21	- 2
Israel	0	0	0	0	6	- 10
Italy	- 3	0	- 5	- 4	- 2	12
Netherlands	7	0	0	8	0	5
New Zealand	13	10	10	13	5	0
Scotland	11	9	12	11	4	0
Sweden	1	- 4	1	3	1	0
United States	- 5	- 7	- 6	- 6	1	- 17

Source: Thorndike, R.L. (1973), Reading comprehension education in fifteen countries, International studies in evaluation III, IEA, Wiley, London.

As pointed out in the Unesco report 'Estimates and projections of illiteracy' (Unesco 1978): ".. Although in most countries the effect of literacy campaigns appears to have made a relatively small contribution to the reduction of illiteracy rates (an average of 1.2 per cent points over ten years), in a handful of countries the literacy campaigns have been exceptionally massive during the 1970s. In Brazil, Iran and Tanzania for example, millions of illiterates have been attending literacy classes in recent years, and India is planning to expand its literacy activities considerably in the near future."[1]

The approximate scale of the problem is indicated in Figure 10 mentioned earlier, which is taken from a recent Unesco analysis. Despite a drop in average illiteracy rate it is suggested that nevertheless there may be an increase in the absolute number of illiterates. Thus "the number of illiterates aged 15-19 in the world will increase from 71.4 millions in 1970 to 76.4 millions in 2,000, while average illiteracy rate drops from 26.7 per cent to 15.4 per cent".

Allied to these basic problems which carry many implications for primary education policy (and adult retraining) there also remains important questions as to participation rates in higher

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[1] Estimates and projections of illiteracy, Division of statistics on education, Office of statistics, Unesco, september 1978.

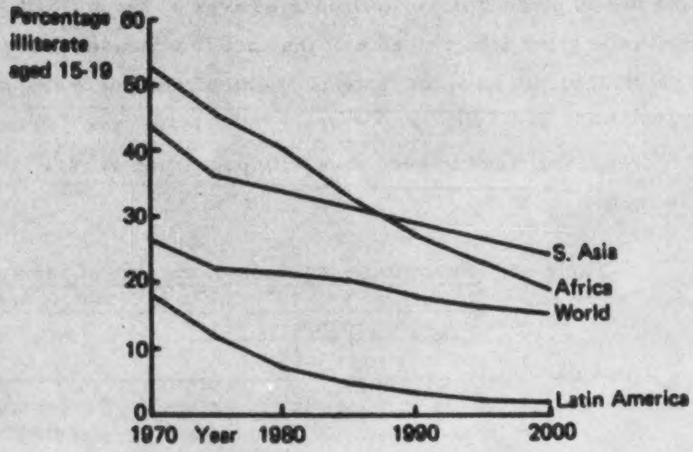

Figure 10.

education, which require extensive tailoring if appropriate skill inputs on a sufficient scale are to be generated.

Such a statement however requires two major qualifications: firstly many of the present limits in respect of technological development in second - and third - world countries are more dependent upon international trade patterns, investment programme, multi-national corporation activity, resource dependency and other exogenous factors, rather than due to limits in internal skill provision; and secondly there still remains fundamental questions - in the Schumachian and Illichian vein - as to the 'appropriate' industrial and cultural format which might be aimed at. There remains much scepticsm and doubt at to whether developing nations are following the wisest path, in some cases in emulating Western society standards (see for instance Dore 1976[1]).

Whilst there are undoubted economic and social gains to be found in the philosophy of NIEO, there are also cultural trade-offs which are important and which carry subtle educational implications.

There are, therefore, to be found a complex mixture of educational requirements and an associated need for experiment as well as commitment to expanded educational provision. A useful review of such developments is provided by the Unesco study 'Educational trends in 1970: an international survey' (Paris 1970); see also Trends and Projections of enrolment by level of education and by age (World and regional aggregates 1960-2000; individual developing countries 1960-1985), (Unesco 1977) and Estimates and projections of illiteracy, Unesco, Office of statistics, september 1978.

It is perhaps worth emphasising that whilst figures and tables above illustrated the scale of international difference with respect to literacy (and hence other dependent cognitive skills) nevertheless though indicating the scale of expansion of the education sector for various continents, this is no measure of the adequacy of provision. With respect to adequacy of provision then we still observe enormous challenges in the future.

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[1] Dore, R. (1976), The diploma disease: Education, qualification and development, Unwin, London.

However this has to be seen in several perspectives of which I will just mention three facets: firstly despite the great achievements of the past two decades there still remains an enormous absolute value of births (real and potential) which requires increasing commitment at primary and secondary level, especially with respect to 'wastage rate'; Unesco (1977) have considered the enrolment increase required to keep pace with population growth for a range of variants as shown in Table 14 below.

Table 14. Percentage increase in enrolment required during the two periods 1975-1985 and 1975-2000 to maintain the 1975 enrolment ratio for the age-group 6-11 years

Region	Enrolment ratio in 1975	Percentage increase in enrolment required between 1975 and 1985 to maintain 1975 enrolment ratio			Percentage increase in enrolment required between 1975 and 2000 to maintain 1975 enrolment ratio		
		Medium variant	Low variant	High variant	Medium variant	Low variant	High variant
M D R	93.8	3	- 2	11	9	- 3	26
L D R	61.6	30	25	33	73	50	95
Africa	51.1	35	33	37	107	80	123
Latin America	77.9	28	23	33	75	47	103
South Asia	60.6	29	24	32	63	42	85

N.B.: "The last three columns of Table 14 show the required increase in enrolment between 1975 and 2000 to maintain the 1975 enrolment ratio. According to the medium variant, the LDR would have to increase their enrolment in this age-group by some 73 per cent just to keep pace with population growth. This compares to about 9 per cent for the MDR."

The cost - economic and social - is of course quite considerable; whether attempting to 'keep up' or not attempting to!

Secondly, the comparative advantage of developed nations due to significantly higher participation rates in tertiary education, whether either considered singly or in combination with the former problem, makes severe inroads into world competitive, economic and trade terms and carries many implications for the difficulties of achieving national growth according to Western standards. Thus an expanded requirement at primary and secondary level imposes an increasing strain on already strained GNP commitments whilst the highly organized tertiary education sector of developed nations continuously feeds economic disparity. Figure 11 below shows the approximate world wide pattern of admissions during the 1950s and Figure 12, the sorts of aims of educational provision for the sixties and seventies. It is of interest to compare the data presented in the other tables, given earlier in this section, with these estimates.

It should be recognised however that 'ceilings' on educational budgets, in terms of percentage GNP, are very much under discussion - and in part implemented - in developed nations. This has been subjected to a range of economic, social and political analyses and criticism and will not

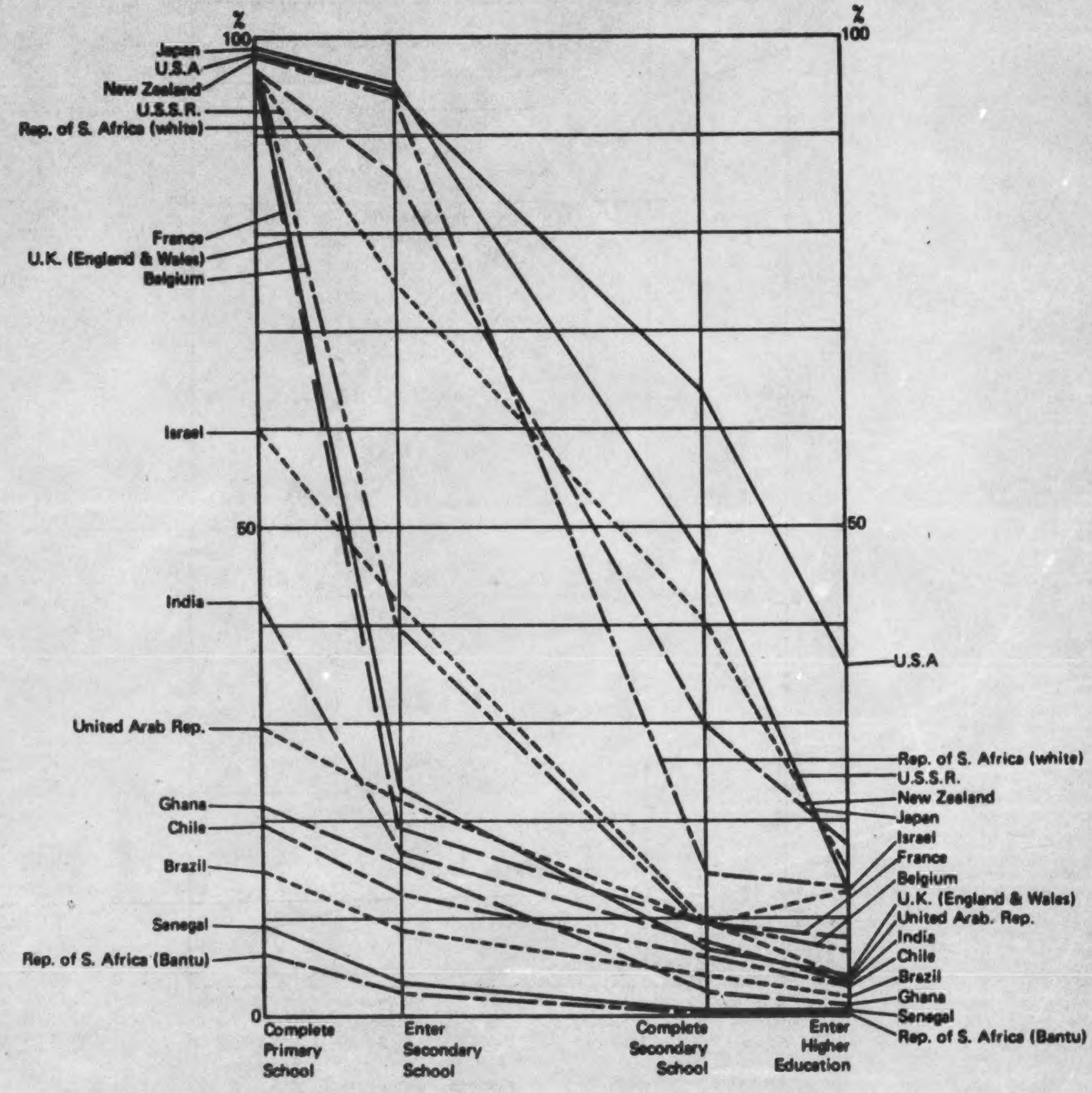
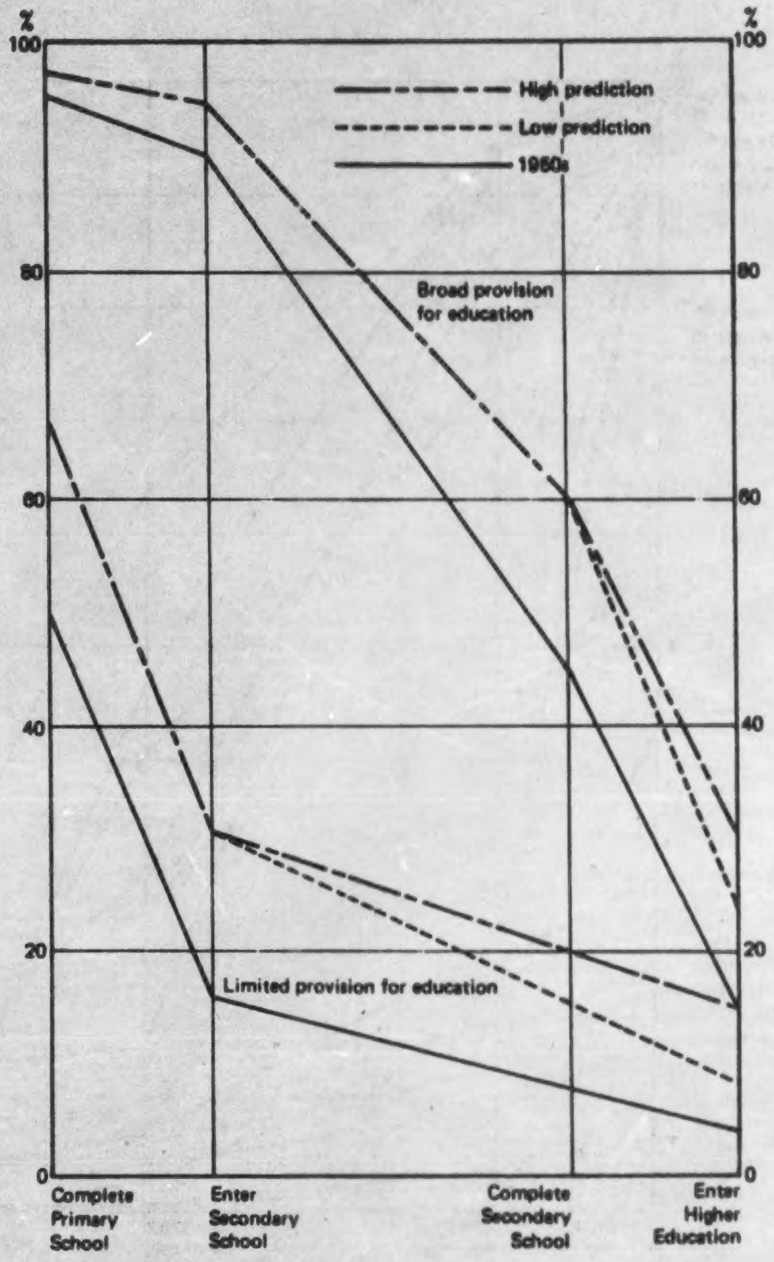


Figure 11. The admissions process in the 1950s

be dealt with here excepting to say that the sheer cost involved plays an important part in this equation. As Figure 13 below indicates, even the U.S. value for percentage of GNP devoted to education has begun to level as early as the middle sixties. Which is in part the result of the increasing cost of education as shown in Figures 14 and 15.



Estimated percentage of age group remaining in admissions

Group at key points in the admissions process

Figure 12. The admissions process in the 1960s
Predicted changes in the two forms

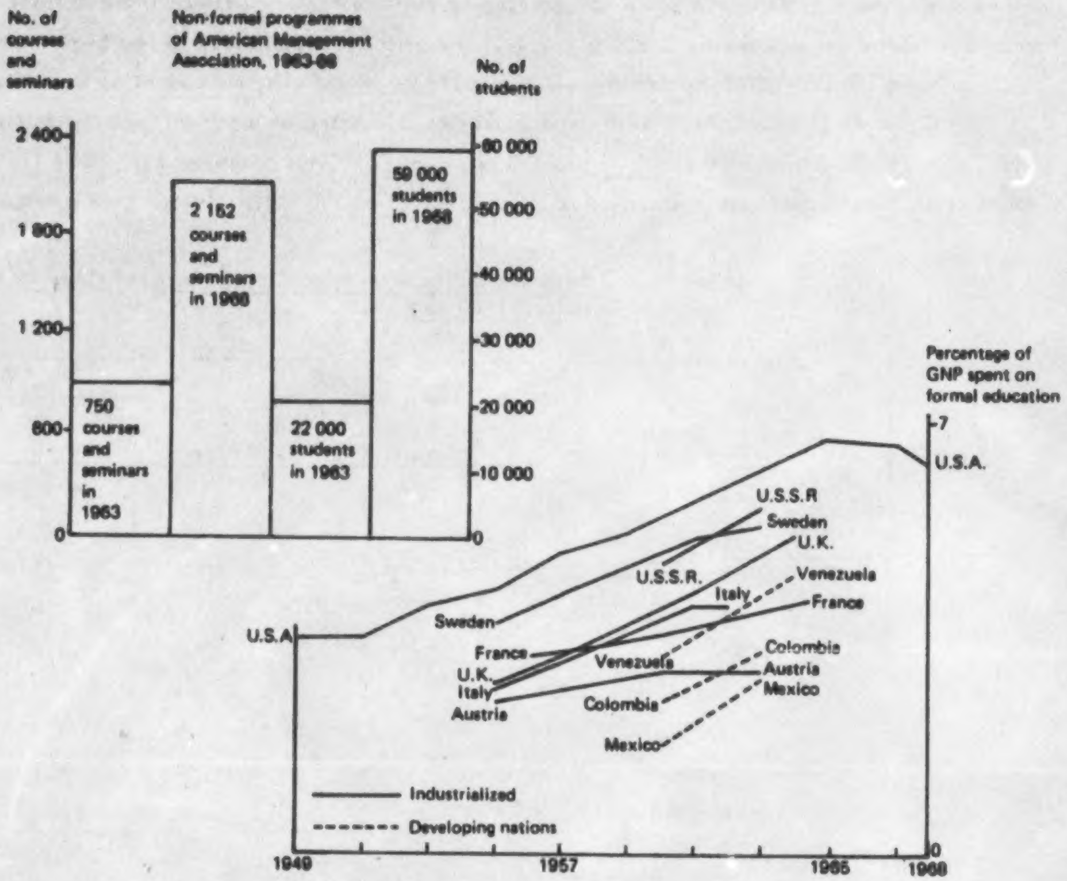


Figure 13. World-wide GNP percentages spent on formal education and US example of non-formal educational growth

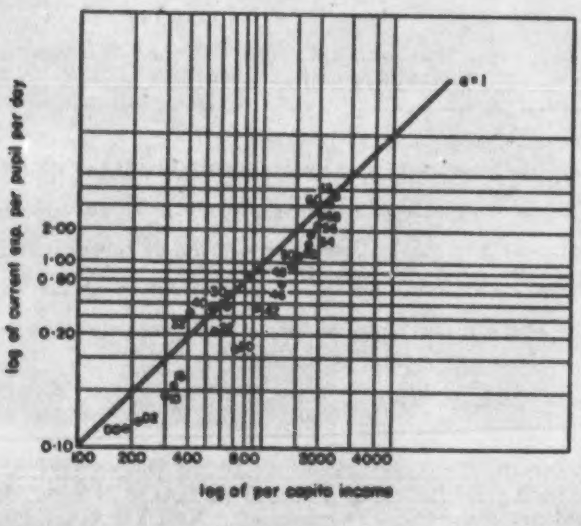


Figure 14. Historical trends and present patterns

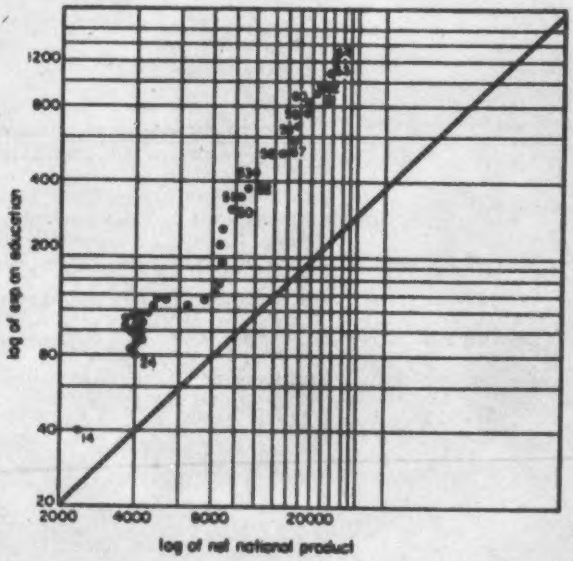


Figure 15. The social-demand approach

We may therefore sensibly ask if financial limits are being reached by developed nations and herald important danger signals for developing nations ? Similarly bearing in mind that "in many countries education was taking 10-15 percent of government expenditure at the beginning of the sixties, 20-25 percent by the end of the decade" (Dore 1976) we might suspect budgeting saturation.

However in examining public expenditure on education as a percentage of national income (see Table 15) which in 1960 amounted to 3.6 per cent (world average) and in 1965; 4.5 per cent would seem, with appropriate shuffling of priorities, to be the ability to continue expansion.

Table 15. Public expenditure on education as a percentage of national income, 1960 and 1965

	1960		1965	
Continental region	National income	Number of countries	National income	Number of countries
	%		%	
Africa	3.0	21	4.3	22
America, North	3.9	15	4.1	14
America, South	3.1	11	4.0	11
Asia	3.3	16	4.0	16
Europe (Inc. USSR)	4.2	25	5.3	24
Oceania	3.7	2	4.4	2
World	3.6	90	4.5	89
Selected developed countries[1]	4.7	20	6.2	20
Selected developing countries[2]	2.9	30	3.8	30

1. Countries with GNP per capita above $1,000 (around 1965)
2. Countries with GNP per capita below $33 (around 1965).

Source: World survey of education, Unesco V 1971 Paris (pp. 66,78).

(See also Table 7, page 343of this text) and also International development of educational expenditure 1960-74 (ST/S/23 Unesco 1977).

Similarly enormous cost reductions might be incurred by technological aids (see Diebold[1]) but discussion in such aggregate terms says little about relative financing of primary, secondary, tertiary, educational sectors for developing countries, nor does it provide advice as to content, curricula range or social rôle of education. Such decisions can only be understood in an ideological and economic strategy context - and this has to be seen at the level of individual countries and/or economic blocs.

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[1] Diebold, J. (1971), Education, technology and business, (A case study of business in the future - problems and opportunities) (Private enterprise in a post industrial society), Praeger Inc., New York.

At least two general strategies might be considered: an equalitarian one which aims at providing extended and ultimately universal primary and secondary education (with long-term implications) and/or one which temporarily directs funds towards an expanded tertiary sector (with medium- and long-term implications). The latter strategy might have certain economic policy strengths but runs many elitist dangers - and also can be counterproductive, as argued by Dore (1976). A combination of both strategies is no doubt required (and occurring).

In terms of skill provision an early industrial phase may be comparatively undemanding in terms of its reliance upon the output from tertiary education, but as the technological sophistication advances - in particular where R and D is to be 'home-based' - the reliance upon tertiary levels of education increases.

Unesco has reported in its studies that there has been such a shift in educational spending (and participation rates) towards the tertiary level. Ultimately the degree, form and speed with which the process develops will depend upon, and shape, industrial, economic and cultural goals. NIEO developments, energy availability, resource richness and other international arrangements form the framework of a particular nation's path.

This then takes me to my third point, namely the socio-economic goals of developing nations and the rôle of the 'formal education' sector to those goals. Only the briefest reference, let alone analysis, can be made here on this immensely complicated subject.

Very briefly we might refer to several inter-related factors - whether an LDC is aiming at some form of industrialised Western economy, whether or not it favours a more 'appropriate socio-technological path', whether it favours some combination of these two. (The paper given by Mr. Adiseshiah in this series highlights these problems for the Indian subcontinent). From these competing frameworks derive a range of varying policy issues in relation to the rôle of formal and informal education programme, of the future development of the formal, informal economy, of the rôle of tertiary education, of the form and goals of primary and secondary education, etc. Dore, Adiseshiah, and many others have partially discussed the difficulties of attempting to relate a 'Western style' education provision system to the socio-economic structure of LDC's etc.

The resolution of these difficulties, or incompatibilities, will depend upon many international and national developments. At an international level, NIEO factors may ultimately play a considerable rôle whilst at a national level the dominant socio-culturel pattern may show very large differences from nation to nation. As, for instance, when comparing Brazil, Iran, Pakistan, Mexico and Chile, developments with respect to literacy, with respect to participation rates and enrolment rates in the 1990s, with respect to the place and rôle of education in relation to employment, will then have to be seen in a more local light.

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This paper has primarily emphasised the rôle of the 'formal' education sector and its present and future rôle in relation to technical and social change. It is perhaps important to note that there is now an increasing cognisance of the way in which the so-called 'informal' education and training sector is developing in many countries - and the relationship between the formal and informal sectors.

At this stage it is very difficult indeed to delineate exactly what is the form, nature and potential of the 'informal' education sector, other than to note that it is outside the formal sector, differs greatly from country to country, and though often of a short-lived nature (in some branches) nevertheless often offers a more immediate, spontaneous and realistic route to acquiring a wide range of social and technical skills. In some senses it is more entrepreneurial and adaptive than 'formal' routes - and it is here that its strength lies. But also its weakness, since if it is to have a fundamental and significant input into the society in which it is embedded, then some degree of organisation and centralisation might be required.

The extent to which the informal sector develops in the future may become an issue of major importance.

IV. Summary

This short discussion paper has attempted to raise some of the issues which governments and educationists may have to consider in relation to education policy over the next decade(s).

In relation to the western world emphasis has been placed on the following factors:

(1) The possibility of permanently high levels of structural unemployment, albeit modified by a redefinition of employment and the work-ethic.

(2) If not an entry into a 'post-industrial society' a recognition of major discontinuities in styles of production and dependency upon information technology; allied with this a major move from labour-intensive mechanised procedures to automated procedures requiring very different vocational infra-structures.

(3) A social-search for 'labour-intensive' sectors outside conventional manufacturing sectors; possibly a decline of the service-sector (but recognition that current trends may be reversed); possibly recognition of the education sector itself as a major labour intensive sector.

(4) Increased recognition of the problems of the 'mismatch' problem between educational output and industrial input requirements.

(5) Possible increased supplementation of 'formal' educational sector policies by other social inputs.

(6) Continuing demographic problems; with difficult policy consequences unless more 'elastic' entry-rates; universal participation rates followed.

(7) Possible decline of professional specialisation for some intermediate occupation categories, coupled with increasing emphasis on interdisciplinary training. (However increasing specialization and expansion of numbers in medical sciences; computing).

All of the above factors tend to consider western society as it were in 'isolation' from other world developments. Economic expansion of developing countries may also be reflected in increasing world-demand which counters current employment trends. Nevertheless basic questions facing education-policy will be, as before: (i) scale of provision - in particular at tertiary level. (ii) new vocational requirements. (iii) employment prospects or alternative lifestyles of underoptimised graduates.

'Prediction'

Educational expansion will probably not cease and various cost-effect innovatory steps will be enforced. However this may later induce critical social and political discontinuities hopefully of a peaceful kind.

In relation to 'developing' nations, emphasis has been placed upon the following factors:

(1) Increasing demographic pressures at primary level (and as participation rates increase on ongoing temporal flow effect).

(2) Policy dilemmas as to scale of provision at primary *versus* tertiary level.

(3) Without a coherent industrial and technological policy - in particular with respect to the 'level' of technology envisaged, the policy difficulties as to the profile of manpower requirements, and hence training-policy difficulties.

(4) Continuing, if not increasing difficulties as to the competing rôles of education as a conservative social control force and a social activating force.

(5) Increased technological innovation and cost-reduction devices to offset demographic pressures; however this will be largely dependent upon the degree of economic performance and social stability.

(6) Increasing problems due to 'lost generation' effects.

V. Prospects for research

In 1963 during the foundation year of the IIEP they were instrumental in putting together a taxonomy or list of categories of education research areas and topics which was considered to be of importance either in reflecting ongoing work and/or as a means to providing flag-markers for future work. Such a list was found to be very useful and has been extended and discussed by Coombs[1]. The list is summarised below:

(a) Educational costs and efficiency

Project 1. Raising productivity and reducing costs in established educational systems.

Project 2. Development and dissemination of improved methodologies of educational cost analysis.

Project 3. Educational unit costs in developing countries.

Project 4. Applying educational innovations in developing countries.

Project 5. The economic aspects of pilot literacy programmes.

Project 6. Comparison of alternative methods of vocational training.

Project 7. Economic advantages of multi-national co-operation in education.

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[1] Bereday, G.Z.F. and Lauwerys, J.A., *Educational planning (The Yearbook of education 1967)*, Evans, London 1967.

(b) Financing education

Project 8. Methods of financing education : a comparison.

Project 9. How much should a nation spend on education ?

Project 10. Financing the expansion of compulsory education.

(c) Teachers

Project 11. Balancing the supply of and the demand for teachers.

Project 12. The education of women and their place in the teaching profession.

Project 13. The village school teacher and rural development.

(d) Manpower aspects

Project 14. Methods of manpower projections: A critical evaluation.

Project 15. The educational content of middle-level skills.

Project 16. Adapting professional training to the needs of developing countries.

Project 17. Adjusting popular demand for education to the practical needs of national development.

(e) The planning process

Project 18. Country case studies.

Project 19. The evolution of the educational planning process.

Project 20. Organization and administration of educational planning.

(f) International aspects of educational planning

Project 21. Strengthening educational planning through external assistance.

Project 22. Improving the effectiveness of external aid by educational planning.

Project 23. Adapting imported educational methods.

Project 24. The rôle of expatriate educational personnel.

Project 25. Raising the effectiveness of study and training abroad.

It might be instructive if the members of this seminar carefully scrutinised the list, deciding upon its appropriateness in 1978 and whenever possible justifying replacement of addition of topics.

What would be the guidelines or criteria for such a task ? That in itself is a most important 'project item'.

For my part I would suggest that at least the following areas be included:

(1) The timescale envisaged for education policy and the timescale of effectiveness.

(2) The limits if any to educational budget; its implications and innovatory ways around such limits.

(3) The balances and rôle of social containment, cultural transmission and social activation and questioning in education curricula, viz. Education reviewed as a 'conservative force' and as a 'social catalyst'.

(4) With respect to developed nations; education policy in relation to discontinuities in industrial profile and possibly 'permanent structural unemployment'.

(5) With respect to developing nations; comparison of policy option in relation to primary, secondary and tertiary in relation to demographic pressures; economic resource and socio economic strategy.

(6) The difficulties of transmission from planning to implementation.

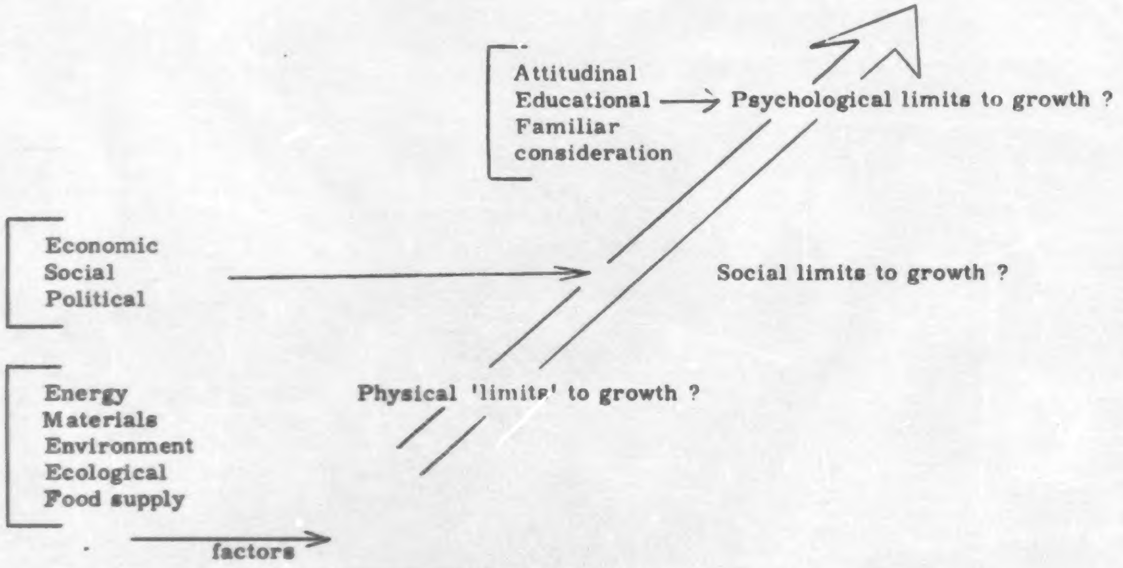
The justification of such topics remains to be developed, but the underlying guide should be pragmatism.

VI. Footnote: the psychological limits to growth: three steps

With the work and approach of Forrester, Meadows and others, and the influence of the Club of Rome, a dominant view emerged, making great reliance upon Malthusion concepts, that 'The limits to growth'[1], economic expansion of the third world - and containment of the 'developed' world was necessary due to what was primarily seen as physical limits (of resource and environmental provision systems).

This view was later countered by a variety of sources, but in particular from such groups as the SPRU unit at Sussex, England and the Bariloche group of Argentina, who emphasised distributory, innovatory and socio-political arguments. A second step was taken with the emergence of Hirsch's 'Social limits to growth'[2], which placed emphasis upon the limiting effects of social hierarchies, and competition - ultimately resulting in a treadmill from which no one gains and which is ultimately cost-prohibitive. To a lesser degree, then with respect to education, Dore's 'The diploma disease'[3] spells out a similar warning with respect to the qualification rat-race which whilst counterproductive and intellectually de-energising for the West may be disastrous for the Third World.

It is perhaps pertinent to consider the next logical step in this argument, namely the 'Psychological limits to growth'[4] - or at least to analyse social roots in terms of the more basic and fundamental psychological fabric which determines and reshapes all other considerations. (This is not to ignore the two-way interaction of 'macro-sociological' forces and 'micro-psychological' factors:


Attitudinal
Educational
Familiar
consideration
Psychological limits to growth ?
Economic
Social
Political
Social limits to growth ?
Energy
Materials
Environment
Ecological
Food supply
Physical 'limits' to growth ?
factors

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[1] Meadows, D.H., Meadows, D.L., et al. (1972), The limits to growth Universe books (New York).

[2] Hirsch, F. (1977), The social limits to growth, Routledge and Kegan Paul, London.

[3] Dore, R. (1976), The diploma disease: Education, qualification and development, Unwin, London.

[4] Whiston, T.G., The psychological limits to growth ? (in preparation).

Within this hierarchical network we then may begin to consider the vocational, attitudinal and perceptual rôles of education and their relevances to the discussion of social, political and economic futures.

Inevitably the effects of 'formal' educational processes must be compounded with the effects due to the informal social fabric upon attitude, perception and energies of individuals and ultimately societies - in part explored by Freud[1] and continued by many others.

Perhaps it is, perhaps not, possible to satisfactorily formulate a useful and pragmatic model which lays emphasis not only upon macro-socio-economic factors and policies, but also upon the micro-psychological dimensions. In any event the attempt and challenge is very necessary. Government and cultural policies are rejected or non-implemented on the basis of attitudinal barriers which whilst not quantifiable are nevertheless very real.

Man's humanistic and affective framework which contains, controls, and directs, cognitive actions - 'policies' has long been missing from such systems modelling[2]. There are both professional and pragmatic reasons for this; but such absence leads to a somewhat quixotic framework.

A consideration of education policy, education goals, the shaping of human intellect over and above the provision of cognitive-vocational skills; offers a most powerful tool for monitoring the future social pathways of society - at least in terms of goals, not necessarily in terms of attainment.

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1. Freud, S., (1930), Civilization and its discontents, Hogarth Press, London.

2. Whiston, T.G., (1972), Environmental decoupling: a developmental approach, collected Readings 6th International Congress on cybernetics Namur, Belgium, 1045 - 1963.

APPENDIXES

Appendix I

PROGRAMME

Monday, 23 October 1978

Mr. M.S. Adiseshiah, Chairman

10.00 - 12.30 Plenary session :
14.30 - 17.30 general discussion

Tuesday, 24 October - Wednesday, 25 October 1978

9.30 - 12.30 Three Working Groups:

14.30 - 17.30 Mr. B. Suchodolski, Chairman
Mr. J.P. Naik, Rapporteur
Group I: The place of education in development projections up to Horizon Year 2000.

Mr. P.H. Coombs, Chairman
Mrs. N. Sudarkasa, Rapporteur
Group II: World trends in school enrolment and long-term prospects for educational development.

Mrs. G.L. de Romero Brest, Chairman
Mr. A.E. Solari, Rapporteur
Group III: Trends in the relations between education and employment.

Thursday, 26 October 1978

Mr. M.S. Adiseshiah, Chairman

9.30 - 12.30 Plenary session : presentation of the reports of the Working Groups.
14.30 - 17.30 Plenary session : final discussion and closing of the Seminar.

Appendix II

LIST OF PARTICIPANTS

Mr. M. S. Adiseshiah
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Mr. E. Solomon
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Mr. B. Fredriksen
Statistical Projections of Education
Division of Statistics on Education
Office of Statistics

International Institute for International Planning

Mr. M. Debeauvais, Director
Mr. R.M. Avakov, Staff member responsible for the Seminar
Mr. D. Berstecher
Ms. F. Caillods
Mr. J. Hallak

Miss S.M. McDowall, Secretary
Mrs. M.-P. Boillève, Secretary

Appendix III

LIST OF DOCUMENTS PRESENTED AT THE SEMINAR

(Note: the documents marked + are included in this volume)

M.S. Adiseshiah	+Future Asian education
R.M. Avakov	Note: Seminar on long-term prospects for the development of education
P. Zagefka	+The place of education in long-term projections for development
C.E. Beeby	Education as an instrument of change
A. Belrhiti	Rôle des facteurs socio-économiques dans le développement intellectuel et l'acquisition du statut professionnel
C. Bereiter	The role of instructional methodology in the educational future of developing nations
F. Caillods M. Debeauvais J. Hallak	Population, éducation et emploi - analyse retrospective
S. Cole	+A comparison of major long-term projection models and their possible implications for education
P.H. Coombs	+Basic education for meeting basic human needs of the rural poor
H. Dieuzeide	+Education and development: some remarks on priorities and challenges for future international action
S. Encel	+The future of education in relation to the new international economic order
H. Geerhardt	Education in the year 2000
R. Grácio	Recherche prospective : le cas du Portugal
M. Gueorguiev	La conception pour le développement de l'éducation en République populaire de Bulgarie jusqu'à l'an 2000
K. Horikawa	Present state of educational system in Japan
T. Husén	Present trends and future developments in European education
IIEP	Long-term prospects for school education in developing countries: some preliminary results of an IIEP study
H. de Jouvenel	+What of education for the future?
B. Kluchnikov	+Reflections on the future development of education
M.I. Kondakov	+Education and the man of the future
J. Kutas	La relation respective de la planification de la main d'oeuvre et de l'enseignement en Hongrie

E. Laszlo	The education of educators
Le Thanh Khoi	+The future shape of education?
H.A. Linstone	+The future of education: a global long-term perspective
A.A. Mazrui	+Educational dependency and the new international cultural order: the African university as a case study
K.R. McKinnon	Long-term prospects for the development of education
J. Mericka	The future preparation of professionals
F. Orivel	+The economic consequences of the long-term prospects for the development of education in developing countries
G.L. de Romero Brest	+Education from the vantage-point of the year 2000
A. Saveliev	+Forecasting models applied to education
B. Sefer	+Long-term prospects for the development of education
S. Strömqvist	Some notes on the changing relations between education and employment
B. Suchodolski	+The future of education
N. Sudarkasa	+Sex roles, education and development in Africa
UNITAR/CESSTW	Progress in the establishment of a new international economic order: obstacles and opportunities
T. Whiston	+The development of education: its technological and social dimensions
H.-P. Widmaier	Basic needs in the social and educational sector and state policy

Appendix IV

WORKING GROUPS

GROUP I : THE PLACE OF EDUCATION IN DEVELOPMENT PROJECTIONS UP TO HORIZON YEAR 2000

B. Suchodolski (Chairman)
J. P. Naik (Rapporteur)
H. Becker
H. S. D. Cole
H. De Jouvenel
S. Encel
H. Geerhardt
L. Georgiev
M. I. Kondakov
E. Laszlo
Lê Thanh Khôi
H. A. Linstone
E. Naraghi
A. Saveliev
B. Sefer
G. N. Uzoigwe
P. Zagefka
R. Avakov, IIEP

GROUP II : WORLD TRENDS IN SCHOOL ENROLMENT AND LONG-TERM PROSPECTS FOR EDUCATIONAL DEVELOPMENT

P. H. Coombs (Chairman)
N. Sudarkasa (Rapporteur)
S. Amin
C. E. Beeby
C. Bereiter
A. Belrhiti
R. Diez Hochleitner
J. C. Eicher
R. Gracio
K. Horikawa
H. Jadutte
K. R. McKinnon
M. F. Orivel
M. Debeauvais and D. Berstecher, IIEP

GROUP III : TRENDS IN THE RELATIONS BETWEEN EDUCATION AND EMPLOYMENT

G. L. De Romero Brest (Chairman)
A. E. Solari (Rapporteur)
M. S. Adiseshiah
G. Betancur Mejia
J. Kutas
J. Mericka
In'am Mufti
S. Stromqvist
A. Tevoedjre
T. G. Whiston
H. P. Widmaier
J. Hallak and F. Caillods, IIEP